Fruitridge Vista Water Company

Urban Water Management Plan

Adopted December 5, 2011

Prepared by:

Fruitridge Vista Water Company

This document was prepared by Mark Chrisler, Financial Manager, FVWC; and Fruitridge Vista Water Company Staff at the request and direction of the General Manager, Robert C. Cook, Jr.

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The Water supplier is a: Privately-Owned Water Company

The Water supplier is a: Retail Water Provider

Is This Agency a Bureau of Reclamation Contractor? No

Is This Agency a State Water Project Contractor? No

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OVERVIEW OF UWMP

This Urban Water Management Plan includes the information necessary to meet the requirements of California Water Code Division 6 Part 2.6, the Urban Water Management Planning Act. Chapter 3, Article 3. (Appendix E – Urban Water Management Planning Act). The organization of this Urban Water Management Plan (UWMP or Plan) follows the California Department of Water Resources Guidelines for the development of an UWMP. When applicable, each section or subsection will include the excerpt from the California Water Code at the beginning to provide the basis of the information contained within that section. In instances where specific information is not available to respond to the code excerpt, the Water Code Section provides a reference to why the data is needed; additionally, this sets up a starting point for data collection for future UWMP updates. The UWMP will cite references that are critical supporting documents when describing the quantity, availability, and reliability of the various water supplies. As required, this Plan includes the projection of water demands and the various programs underway for improved water conservation and water shortage contingency plans.

Water Code Section 10620

(a) *Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).*

(b) *Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.*

(c) *An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.*

(d) *(1)* *An urban water supplier may satisfy the requirements of this part by participation in area wide, regional, watershed, or basin wide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.*

(2) *Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.*

(e) *The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.*

(f) *An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.*

Water Code Section 10617

"Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

Water Code Section 10621

(a) Each urban water supplier shall update its plan at least once every five years on or before December31, in years ending in five and zero.

(b) Every urban water supplier required to prepare a plan pursuant to this part shall notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

(c) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3(commencing with Section 10640).

REQUIREMENT FOR AN UWMP

All urban water suppliers in the State of California are required to prepare an UWMP and complete updates at least once every five years on or before December 31, in years ending in five and zero. As defined by the California Water Code (Section 10617) an "urban water supplier" is a supplier, either publicly or privately owned, that provides water to more that 3,000 customers or supplies more than 3,000 acre-feet of water annually on a wholesale or retail basis or both.

In accordance with Water Code Section §10610 et seq., this 2010 UWMP has been prepared at the request of Fruitridge Vista Water Company (FVWC or Company). FVWC presently serves approximately 4,688 residential, commercial and industrial connections and approximately 5,280 AFA; therefore, per the provisions of Water Code Section 10617 the Company is required to prepare an UWMP. Of the 4,688 connections, approximately 726 of the connections are metered and 3,962 are unmetered.

The UWMP will assist the Company in future water planning activities, provide a systematic approach to service area capital projects, such as, meter retrofits, conservation planning and system reliability projects. The most pertinent project is listed below:

- Water System Evaluation and Replacement Project

PURPOSE OF THE UWMP

This 2010 UWMP has been developed by FVWC to meet its responsibilities as a retail water supplier in southern Sacramento County. An UWMP contains information about an urban water supplier's water supplies, water supply reliability, water conservation, water shortage contingencies, and recycled water usage. Because FVWC has relationships with adjacent water agencies and water wholesalers, this UWMP will discuss those issues that relate to the City of Sacramento and California American Water Company (Cal-American), formerly Citizen's Utility Company of California. The UWMP is a valuable long-range water supply and demand planning document and is the foundation document for Water Supply Assessments (Senate Bill 610) Water Code §10613 et seq. (Added by Stats. 2001, c. 643), Written Verifications of Water Supply (SB 221) Water Code §66473.7 (Added by Stats. 2001, c. 642).

PUBLIC PARTICIPATION

Water Code Section 10642

Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

FVWC encourages public participation in the development of this UWMP. In the development of its UWMP, FVWC solicited comments on the Draft UWMP from its water wholesalers (i.e. City of Sacramento) and adjacent water purveyors Cal-American. Copies of this Draft UWMP were available for review beginning November 1, 2011 at the office of Fruitridge Vista Water Company located at 1108 2nd Street, Suite 204, Sacramento, CA 95814. The UWMP was available for public review for 30 days. No written comments were received on or before the end of the 30-day review period, which closed on Thursday, December 1, 2011.

The public was encouraged to attend a special public meeting held on Monday, December 5, 2011 at the Jose P. Rizal Community Center at 7320 Florin Mall Dr, Sacramento, CA. [Appendix A: Public Notice]. Prior to close of this public meeting, a motion was made to adopt the UWMP, the motion was seconded and as appropriate FVWC's General Manager Robert C. Cook, Jr. formally adopted this UWMP.

SECTION 1 – AGENCY COORDINATION

Water Code Section 10620 (d) (2)

Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

INTERAGENCY COORDINATION

FVWC participates in area and regional planning with the Regional Water Authority (RWA). Participation in these planning efforts helps ensure that FVWC will have access to an adequate amount of water to provide for its residents and businesses. It also provides for drought-condition planning and coordination within the region so that not one particular water provider is unduly impacted by a lack of water, during a regional or local shortage. In addition, the RWA develops water conservation programs to help the member agencies educate their customers and ultimately reduce demands.

FVWC has entered into an Agreement with the City of Sacramento; this Agreement provides treated surface water to FVWC to meet customer demands throughout the year. FVWC has interties with Cal-American to obtain additional supplies in times of dire emergencies. In addition, FVWC provides water supplies to Sacramento County, and the Southgate Parks and Recreation District. In accordance with the California Public Utilities Commission General Order No. 103, FVWC also provides water for fire protection services to the City of Sacramento Metropolitan Fire Department.

Interagency coordination includes the following local government entities:

- California Public Utilities Commission;
- California Department of Public Health - Division of Drinking Water and Environmental Management;
- Regional Water Authority;
- City of Sacramento, Department of Utilities;
- Sacramento County Regional Sanitation District;
- City of Sacramento Metropolitan Fire Department; and
- Southgate Park and Recreation Department;

Other local agencies:

- Sacramento County Environmental Health Department;
- Sacramento County Planning Department; and
- Sacramento City Unified School District (SCUSD).

RESOURCE MAXIMIZATION

FVWC intends to maximize its own groundwater resources. With the addition of water purchased from the City of Sacramento additional knowledge should be investigated to maximize water use through its service area. Currently, these plans include:

- Separate metering systems for fire and landscape uses;
- Metered connections at residences constructed after 1992;
- Installing new groundwater wells and treatment equipment, i.e. Water System Project;
- Increasing pumping at high yield wells; and
- Completion of the comprehensive settlement agreement approved by the California Public Utilities Commission in September 2006.

Water demands are fairly predictable both daily and over the year. Predictability is based on the climatologic conditions within the Sacramento region and knowing the seasonal demands observed during lower demand periods of winter and spring versus higher demands associated with summer and fall. Understanding these trends, FVWC should be able to control the use of purchased water while still using groundwater to meet most of the demands. Tthe Company has an Agreement with the City of Sacramento to purchase up to 3.24 million gallons per day (mgd); FVWC anticipates using this purchased source during periods of peak demand as a means to improve reliability, and maintain system-wide pressure capacities.

SECTION 2 – UWMP CONTENTS

Water Code Section 10631

A plan shall be adopted in accordance with this chapter and shall do all of the following:

(a) Describe the service area of the supplier; including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

SERVICE AREA INFORMATION

In 1953, the Cook family formed FVWC to serve water to homeowners in an unincorporated area south of the City of Sacramento in Sacramento County, California. FVWC is an investor owned water utility governed by the State of California Public Utilities Commission (CPUC). California Department of Public Health (CDPH) also regulates FVWC under its current operating permit.

FVWC's service area covers roughly four square miles. State Route 99 (SR 99) bisects the service area; the majority of the service area to the east of SR 99 being residential, some light commercial and three schools. The areas to the west of SR 99 are a mix of primarily commercial, light industrial and residential including two schools. Other water purveyors surround FVWC's service area: the City of Sacramento on three sides and California American Water Company, a privately owned utility, on the south side. Figure 2-1 shows the Company's service area.

FVWC serves residential, commercial and industrial developments. Most of the residential services are non-metered, and are charged a flat monthly rate based on lot size. Currently, there are approximately 726 metered and 3,962 un-metered, flat-rate services. In accordance with state and county requirements, all new residential, commercial, public and industrial accounts are scheduled to be metered and rates are to be based upon water consumption.

In the Fruitridge Vista service area growth stabilized well before year 2000, lands are now considered 95 percent developed; although staff anticipates some growth in the south and southeast areas between 2010 and buildout in 2020. Prior to 2000, demand averaged 4.2 million gallons per day (mgd). The number of customers served and annual consumption has fluctuated within five percent, average consumption in 2005 was about 2,757 gallons per minute (gpm), which is consistent with the 2000 to 2005 average of about 805 gallons per day (gpd) per connection or 207 gallons per day per capita. In the last eight years, passive conservation efforts have reduced consumption by 327,000 gpd – in 2007 system-wide pumping was 3.8 mgd. The management of FVWC is satisfied with the conservation results achieved over the last five years. At present, these results signify that the Company's limited conservation programs are effective and considered appropriate for a utility of this size.

FVWC operates sixteen (16) groundwater wells as main source of water supply. FVWC has sufficient groundwater supplies to meet demands; however, in the summer of 1998 groundwater Well 11 was contaminated by the gasoline additive methyl-tertiary-butyl-ether (MTBE). Two new wells were installed to replace the loss of Well 11. Wells 1, 2, and 12, located in the northeast section of the FVWC water service area were also contaminated by MTBE and Well 12 also exhibited PCE contamination. FVWC took the wells offline due to the contamination.

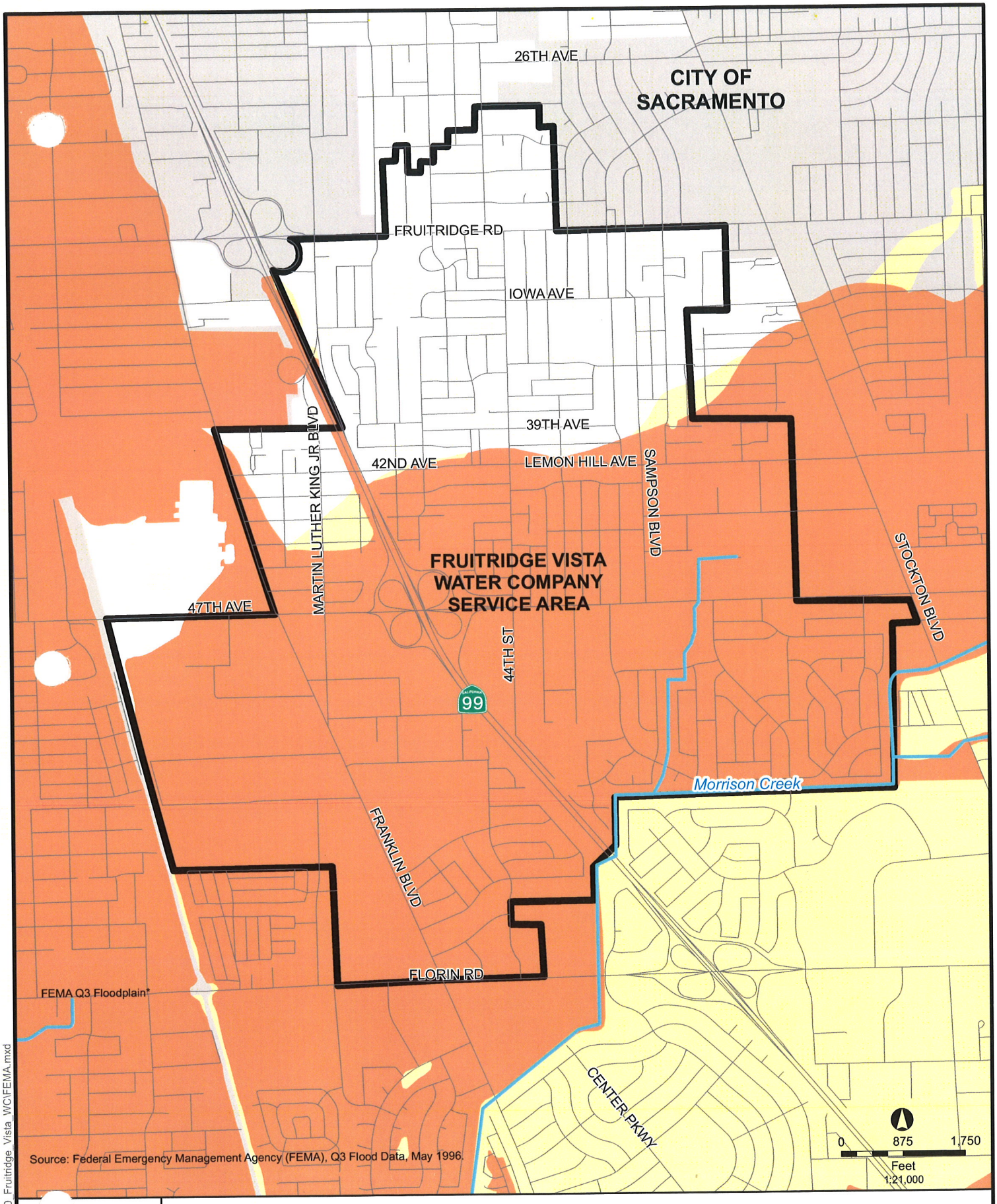


FIGURE **2-1**

Service Area

D51289.00

Fruitridge Vista Water Company: UWMP

N:\GISProjects\D51240_Fruitridge_Vista_WC\FEMA.mxd

Figure 2-1: Service Area

California Department of Health Services, now Department of Public Health sent FVWC Compliance Order 01-09-05-CO-002 on August 29, 2005. New wells added to the system will overcome current impacts to water quality; future impairments could occur due to the contaminant transport in the groundwater basin. The State is requiring FVWC to destroy wells 1,2,11 and 12 due to MTBE and PCE contamination in Well 12; FVWC has replaced this lost supply with three new wells and has two new permanent interties with the City of Sacramento. In the event of a severe supply shortfall, FVWC has access to these new interties plus six other existing interties with the City of Sacramento and Cal-American.

Climate

The City of Sacramento and the surrounding region has an arid Mediterranean climate; the weather consists of long, dry summers and cool, rainy winters. Summer trends extend from May to October. Average temperatures in July are 93°F with lows in the mid 60s. The rainy season is from late November to mid-April; average precipitation is 18.5 inches annually; snow is uncommon and rare. Winter daytime temperatures are generally in the mid-50s to low 40s, and overnight lows often dip below 30°F.

Sacramento has experienced two declared droughts in the last three decades. The drought of 1975 – 1977 accounted for only 7.5 inches of rain and the drought of 1987–1992 is considered the most severe drought in California's history[1]. Conversely, in years following drought periods Sacramento was drenched with rainfall, for example in 1997 regional water levels rose to record highs which threatened levee breaks and flooded parts of the out-lying metropolitan area. This extreme climatic variability is common throughout California. Climate information for the area is illustrated in Tale 2-1 below.

TABLE 2-1: CLIMATE

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Total/ Annual
Monthly Average ETo[a]	0.99	1.73	3.37	5.47	6.89	8.12	8.49	7.48	5.79	4.24	2.04	1.16	55.77
Average Rainfall	3.84"	3.54"	2.80"	1.02"	0.53"	0.20"	0.05"	0.06"	0.36"	0.89"	2.19"	2.45"	17.93"
Average Temperature	46.3	62.4	65.8	68.7	75.9	79.3	75.4	74.8	71.7	64.4	53.8	45.8	61.1
Average Max Day Temperature	61.06	67.07	72.61	78.7	88.52	95.07	99.13	98.55	93.97	85.03	73.00	61.13	76.51

Notes:
All Temperatures = Fahrenheit
a. ETo = Evapotranspiration, is the loss of water to the atmosphere by the combined processes of evaporation (from soil and plant surfaces) and transpiration (from plant tissues).
Source: CIMIS Station 131 and Western Regional Climate Center.

1 State of California Department of Water Resources. *California's 1987-92 Drought: A summary of six years of drought.* Priest, D.F. et al. 1993.

Population & Demographics

The following are some other demographic factors, within Sacramento County, provided by Sacramento Area Council of Governments (SACOG) as presented in the Population and Housing chapter of the Metropolitan Transit Plan Draft Environmental Impact Report (MTP DEIR).

The MTP DEIR analyzed impacts associated with population changes in a six county region through 2035. SACOG projects that Sacramento County, as a whole would continue to experience growth in jobs, housing and population. Table 15-1, SACOG Regional Growth, 2005-2035 anticipates a 51 percent increase in population, 58 percent increase in housing and a 44 percent increase in jobs.[2] Locally, SACOG predicted growth in the Company's four square mile service area could experience growth potential ratio ranging between 8.1–12.0 population per acre.[3] By utilizing 12.0 as the most conservative growth projection, FVWC could see a doubling of population by 2035.[4] Conversely, by using 8.1 as the least conservative growth projection, FVWC could see a population increase of roughly 4,000 people by 2035.[5]

The FVWC service area is a highly urbanized portion of south Sacramento County, and according to Company staff is nearly 95 percent developed. Population is estimated to be approximately 19,000 people residing in the Company's service area. Based on development applications submitted for new connections, some short-term and long-term growth is anticipated. Currently, FVWC estimates 1,050 proposed new connections, which equates to approximately 3,675 new residents between 2010 and buildout in 2020.[6]

FVWC population projections are shown in Table 2-2. It is reasonable to assume based on either population forecast that new connections and new residents will be migrating into the FVWC service area.

TABLE 2-2: POPULATION PROJECTIONS

	YEAR					
Population Area	**2015**	**2020**	**2025**	**2030**	**2035[c]**	
FVWC	20,000	22,800b	22,800[b]	22,000b	20,200	

Notes:
a. Estimate from Robert C. Cook, Jr. Fruitridge Vista Water Company, February 2007.
b. Calculated from 2005 population plus 1,050 new connections at 3.5 residents per connection.
c. Sacramento Area Council of Governments, 2007 Metropolitan Transit Plan for 2035 Draft Program Environmental Impact Report.

Water Code 10631

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments [to 20 years or as far as data is available].

2 Sacramento Area Council of Governments, Metropolitan Transit Plan for 2035 Draft Program Environmental Impact Report, 2007.
3 Sacramento Area Council of Governments, Metropolitan Transit Plan for 2035 Draft Program Environmental Impact Report, 2007.
4 Assumes approximately a current population of 16,215 based on number of connections (3/4", 1" and > 1") and 3.5 residents per connection.
5 Assumes approximately a current population of 16,215 based on number of connections (3/4", 1" and > 1") and 3.5 residents per connection.
6 Assumes approximately a current population of 19,130 based on number of connections (3/4", 1" and > 1") and 3.5 residents per connection.

WATER SOURCES

FVWC has two main sources of potable water supply: groundwater derived from FVWC's sixteen operating wells, and supplementary supplies will be from the City of Sacramento. For years 2005-2009 100% of the company's water is from groundwater. Under an extreme emergency, the Company has access to supplies from Cal-American. At this time, FVWC has six interties that are closed, and used only in emergency situations. As of summer 2011, FVWC is implementing a water facilities and infrastructure project that will add three new wells and two fully operational interties and booster pump stations to the City of Sacramento system. FVWC can purchase 3.24 mgd to meet daily demands throughout the year with no restrictions.[7] Figure 2-2 shows the percentages of water provided by each source of water through 2030.

Figure 2-2: Current and Projected Water Supply Sources

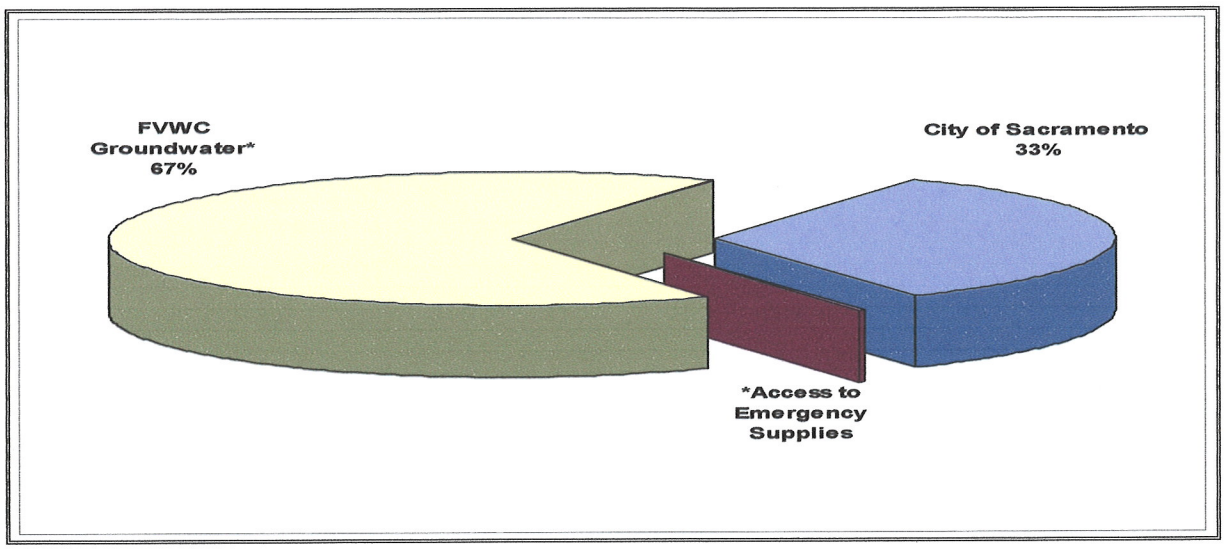


Table 2-3 describes FVWC's current and planned water supply sources.

TABLE 2-3: CURRENT AND PLANNED WATER SUPPLIES (AFA)

Water Supply Sources		2010	2015	2020	2025	2030
Local Groundwater[a]		7,236[c]	7,236[c]	7,236[c]	7,236[c]	7,236[c]
Purchases						
Cal-American[d]		0	0	0	0	0
City of Sacramento (3.24 mgd)[e]		3,629	3,629	3,629	3,629	3,629
Surface Water		0	0	0	0	0
Transfers/Exchanges		0	0	0	0	0
Recycled Water		0	0	0	0	0
Desalination		0	0	0	0	0
Total AFA		**10,866**	**10,866**	**10,866**	**10,866**	**10,866**

Notes:
a. Groundwater is assumed to be drought resistant and is reliable in under all hydrologic conditions.
b. 4,447 AFA less than normal pumping year due to wells (1,2 and 11) out of service from MTBE and well 12 for MTBE and PCE contaminations.
c. Approximately 7,236 AFA calculated with 5,280 AFA average annual 5 years pumping plus estimated pumping from new wells of 3,145 AFA (18,19 and 20) or 2,015 AFA calculating MD:AD ratio and dividing by that 1.56 ratio . A well reduction factor 1.56 discounts the pumping capacity

7 The Agreement with City of Sacramento allows FVWC to draw 2,250 gpm flow pro rata or 3.24 mgd. This is termed as "firm capacity" although is subject to reductions under certain hydrologic conditions. It is reasonable to assume, based on City of Sacramento supply reliability during *those* declared droughts that 3.24 mgd is available in all years. [Sacramento can divert American River Water from the Sacramento River, if flow restriction exist on the Lower American River

for operational limitations that reduce the capabilities of the wells to produce the maximum annual yield.] Anticipated pumping capacity, actual annual pumping may differ. (Well reduction factor provided by PBS&J)

d. Cal-American supplies are utilized in emergency situations only; therefore, this is not included as a permanent supply source.
e. The Agreement with City of Sacramento allows FVWC to draw 2,250 gpm flow pro rata or 3.24 mgd. This is termed as "firm capacity" although is subject to reductions under certain hydrologic conditions. It is reasonable to assume, based on City of Sacramento supply reliability during those declared droughts that 3.24 mgd is available in all years. [Sacramento can divert American River Water from the Sacramento River, if flow restriction exist on the Lower American River]

Source: Fruitridge Vista Water Company, July 2010

Water Distribution System

FVWC pumps groundwater from 16 wells, disinfects with sodium hypochlorite and delivers treated supplies through a 52 mile pressurized distribution and pipeline system (see Figure 2-3). Well capacities range in output from 500 - 1,000 gpm, providing a peak delivery capability of about 10,200 gpm, and are fully capable of meeting normal demand. Normal distribution system pressures range from a minimum of 40 pounds per square inch (psi) to a maximum of 58 psi through average and peak demand periods.

Water Code Section 10631

(b) If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long term overdraft condition.

(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

Water Code Section 10634

The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631,and the manner in which water quality affects water management strategies and supply reliability.

GROUNDWATER SUPPLY

FVWC derives its groundwater supplies from the Central Basin portion of the South American Subbasin of the Sacramento Valley Groundwater Basin (DWR Basin 5-21.65). Depending on well locations and extraction levels, the groundwater quality is typically a combination of magnesium-calcium or calcium-magnesium with bicarbonate. In the vicinity of Elk Grove, a combination of sodium calcium bicarbonate groundwater has been observed. Near the

Figure 2-3: Locations and Distribution System

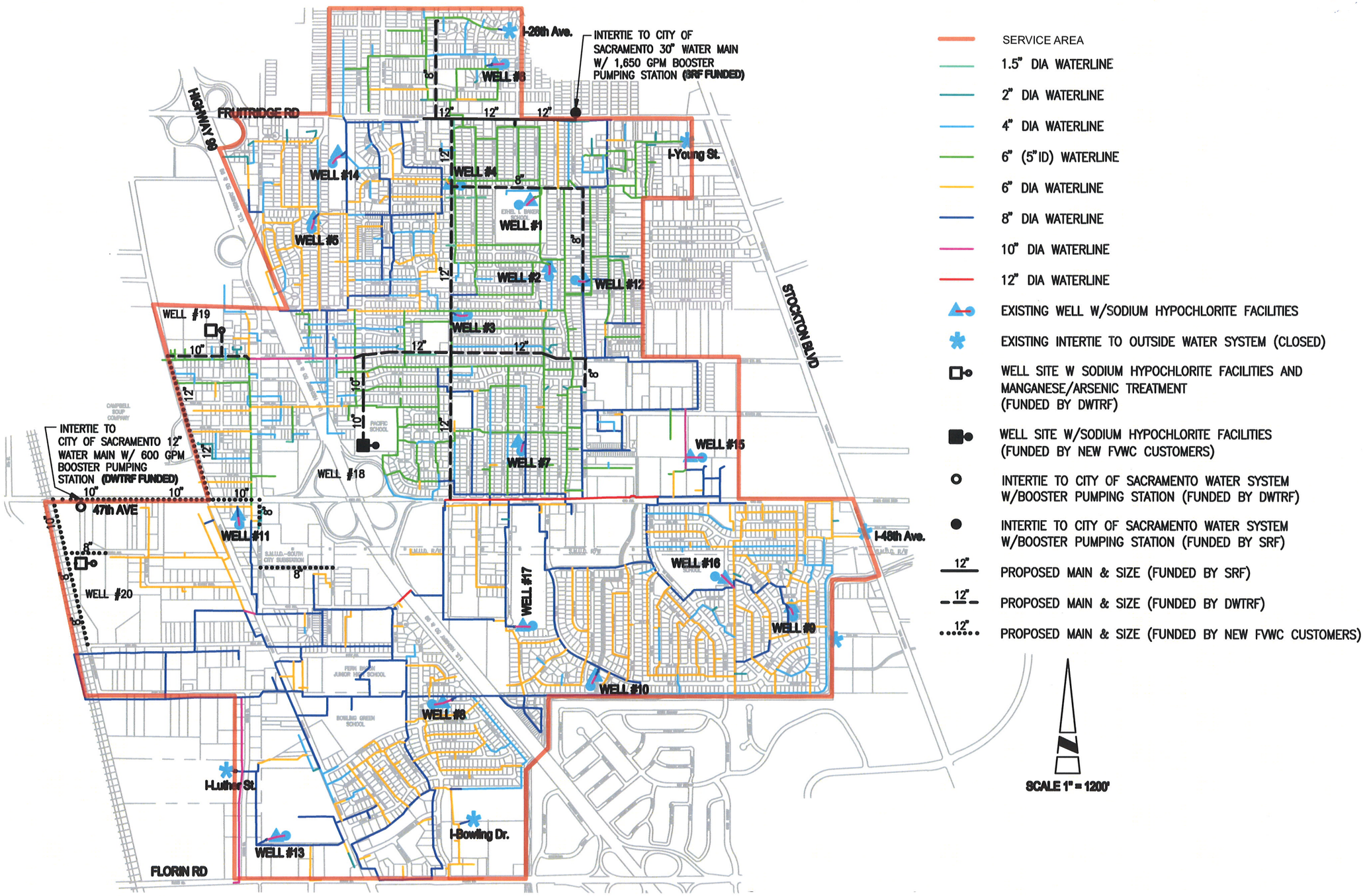


FIGURE **2-3**
Well Locations, Treatment and Conveyance Systems

Source: BOYLE Engineering Corporation, May 17, 2006.

confluence of the Sacramento and American rivers, groundwater exhibits combination of magnesium sodium bicarbonate.[8] On a system-wide basis, the water quality is acceptable and approved by CDPH and is within drinking water standards. A Department of Health Services Engineering Report, included as Appendix D provides a thorough discussion of water quality.

FVWC is dependent upon local groundwater as its main supply source; currently 16 wells operate within their service system. Well locations are shown in Figure 2-3. Well status and current capacities are shown in Tables 2-4 and 2-5, based on flow meter readings taken in November 2005. Appendix C: Boyle Engineering Water System Evaluation presents a complete system analysis.

TABLE 2-4: GROUNDWATER WELLS, CAPACITIES AND STATUS

Well No.	Flowmeter Reading (gpm)	Discharge Pressure (psi)	Status
1	470	40	Inactive MTBE (Emergency Use Only)
2	450	~	Inactive MTBE
3	700	54	Active
4	410	43	Active
5	540	57	Active
6	370	65	Active
7	625	54	Active
8	190	47	Active
9	600	44	Active
10	600	50	Active
11	830	~	Inactive MTBE
12	660	~	Inactive MTBE/PCE
13	1,275	66	Active
14	840	55	Active
15	910	35	Inactive Fe/Mn
16	750	56	Active
17	510	54	Active
Total[a]	10,730	~	~
18, 19, 20[b]	*650*	*N/A*	*Online 2011*

Notes:
a. Boyle Engineering, Water System Evaluation for Fruitridge Vista Water Company, December 2005.
b. Water System Project new wells - For planning purposes estimated at 650 gpm (Boyle Engineering, Water System Evaluation, December 2005) or 2,015 AFA with 1.56 well reduction factor. (Well reduction factor provided by PBS&J) Actual daily and annual capacity may differ as wells come online. See Table 2-3 of this UWMP.

TABLE 2-5: GROUNDWATER WELL PUMPING RATES AND ANNUAL YIELDS

	gpm	Average (mgd)	Annual Average (AFA)	Pumping with Reductions (AFA)
Active Wells	7,410	10.7	11,952	7,659[a]
Emergency Use Only	470	0.7	758	~
Inactive Wells	2,850	~	~	~
Total (Active Wells)	**7,880**	**11.4**	**12,711**	**7,659[a]**

Note:
a. A well reduction factor calculated from MD:AD ratio and dividing by that 1.56 ratio. The well reduction factor discounts the pumping capacity for operational limitations that reduce the capabilities of the wells to produce the maximum annual yield. (Well reduction factor provided by PBS&J)
Source: Adapted from Boyle Engineering, Water System Evaluation for Fruitridge Vista Water Company, December 2005.

8 Department of Water Resources, *Bulletin 118*, updated 2/27/2004.

Tables 2-6 and 2-7 show both historical pumping and the anticipated groundwater production for the next 20 years.

TABLE 2-6: EXPECTED GROUNDWATER PRODUCTION 2010 – 2030 (AFA)

		2010	2015	2020	2025	2030
Groundwater Yield		7,236[b]	7,236[b]	7,236[b]	7,236[b]	7,236[b]

Notes:
a. 4,447 AFA less than normal pumping year due to wells (1, 2, 11) out of service from MTBE and well 12 for MTBE and PCE contaminations.
b. Approximately 7,236 AFA calculated with 5,280 AFA average annual 5 years pumping plus estimated pumping from new wells of 3,145 AFA (18,19, and 20) from MD:AD ratio and dividing by that 1.56 ratio. A well reduction factor 1.56 discounts the pumping capacity for operational limitations that reduce the capabilities of the wells to produce the maximum annual yield. (Well reduction factor provided by PBS&J) Anticipated pumping capacity, actual annual pumping may differ.
Source: Fruitridge Vista Water Company, July 2010.

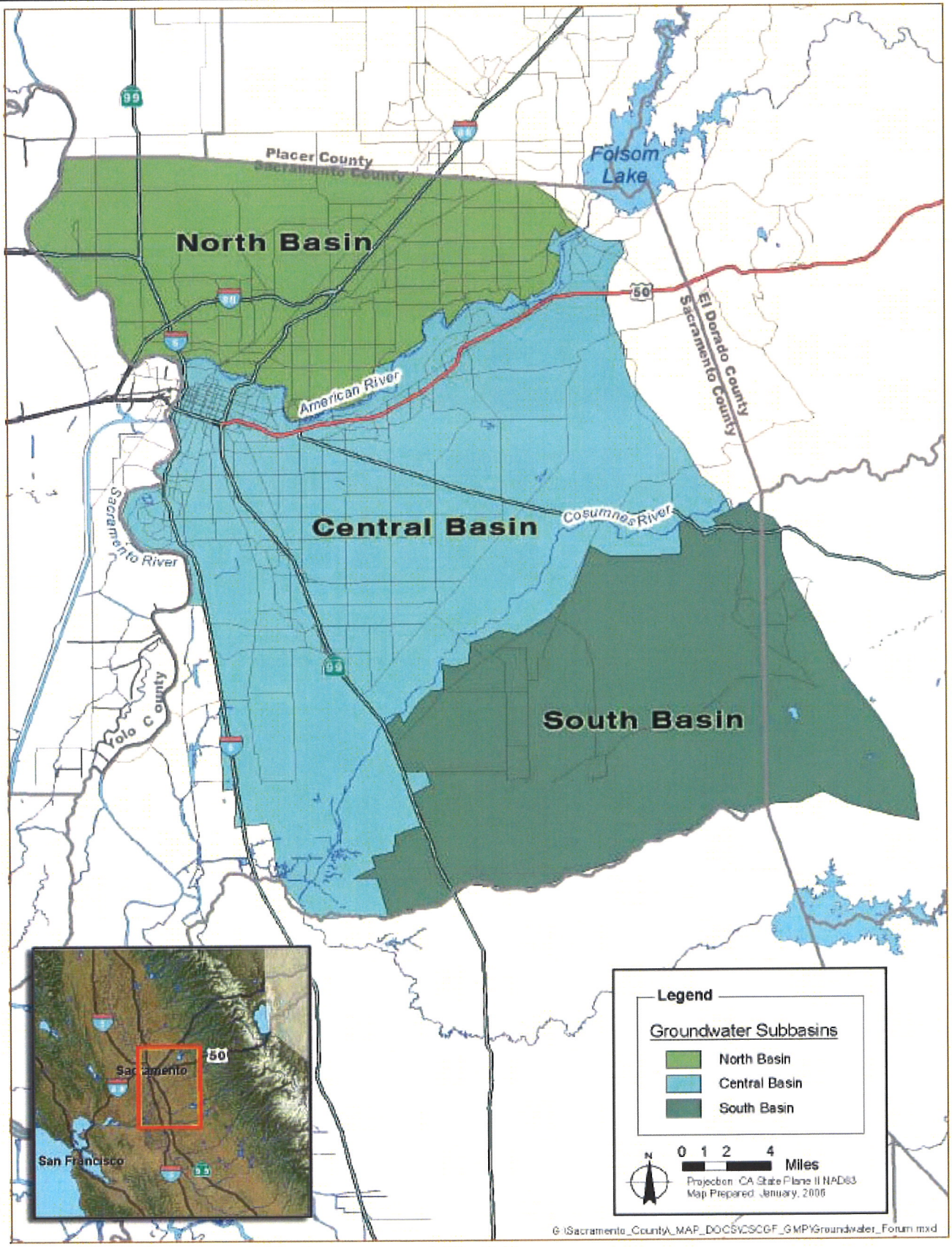
Groundwater Supply within the Central Sacramento County Groundwater Basin

Pursuant to California Water Code 10750 et seq., the Central Sacramento County Groundwater Basin stakeholders, in coordination with the Sacramento County Water Agency and the Water Forum Successor Effort, have developed the Central Sacramento County Groundwater Management Plan (CSCGMP). The CSCGMP represents a critical step in establishing a framework for maintaining a sustainable groundwater resource for the various users overlying the basin in Sacramento County between the American and Consumnes Rivers. It includes specific goals, objectives, and an action plan to provide a "road map" for the governance body as the steps necessary to manage the basin are taken in coordination with the various stakeholders. The CSCGMP describes the sub-surface geology, water bearing units, well yields, water users, monitoring program, Groundwater Management Goal, and Basin Management Objectives. Figures 2-4 and 2-5 from the Executive Summary of the CSCGMP show the subbasin areas and groundwater hydrograph contours.

Water Bearing Formations

The South American subbasin aquifer system is comprised of continental deposits of Late Tertiary to Quaternary age. These deposits include younger alluvium (consisting of flood basin deposits, dredge tailings and Holocene stream channel deposits), older alluvium, and Miocene/Pliocene volcanics, which compose the Mehrten Formation. The cumulative thickness of these deposits increases from a few hundred feet near the Sierra Nevada foothills on the east to over 2,500 feet along the western margin of the subbasin. The maximum combined thickness of all the younger alluvial units is about 100 feet. Calculated specific yield values range from about 5.4 percent in the flood basin deposits to 10 percent in the stream channel deposits (Olmstead and Davis 1961).

Figure 2-4: Sacramento County Groundwater Basins

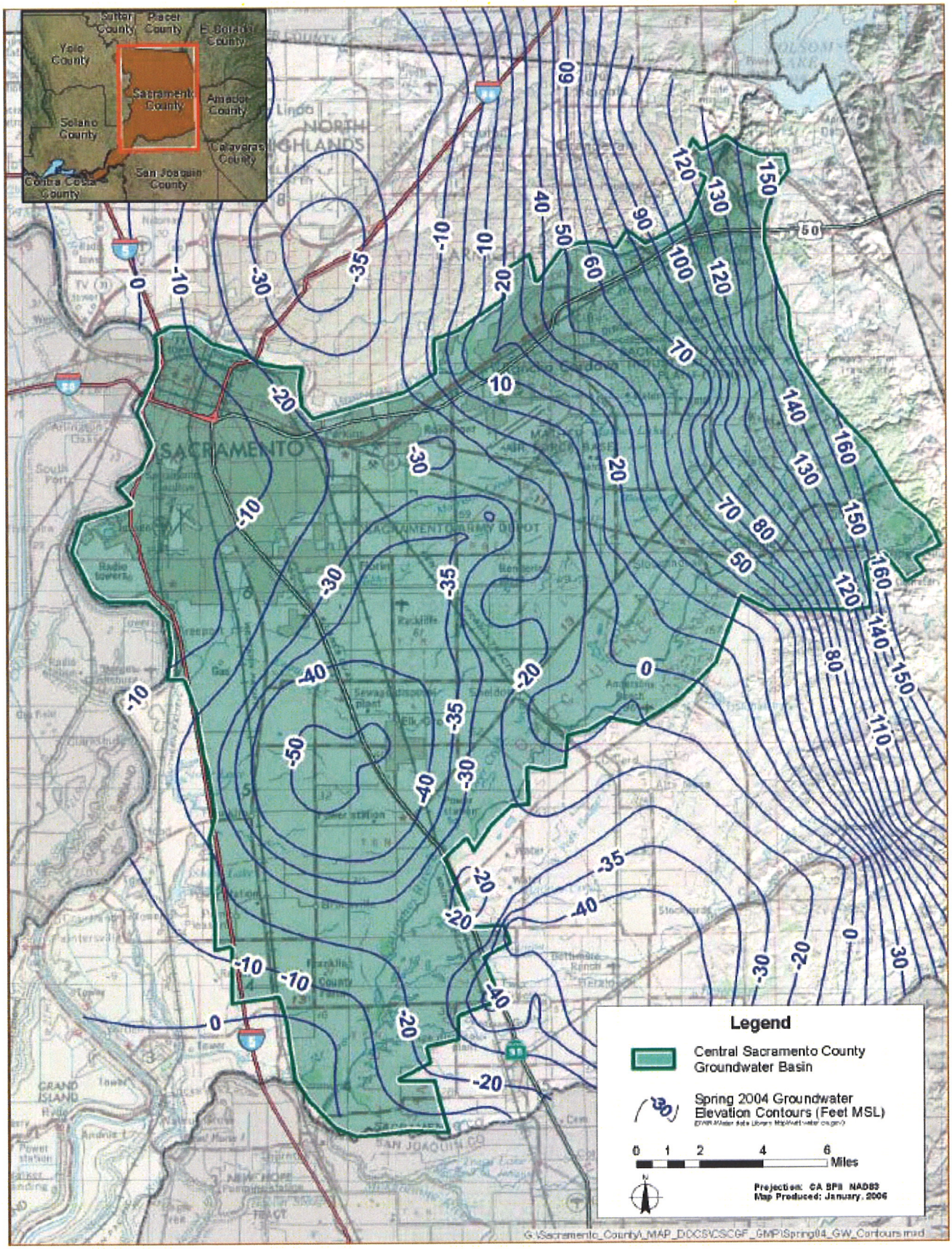


Source: California Department of Health Services, *Fruitridge Vista Water Company Water System Project Initial Study and Proposed Mitigated Negative Declaration*, October 2006.

FIGURE **2-4**

Sacramento County Groundwater Basins

Figure 2-5: Sacramento County Groundwater Contour Map



Source: California Department of Health Services, *Fruitridge Vista Water Company Water System Project Initial Study and Proposed Mitigated Negative Declaration*, October 2006.

PBS&J®

FIGURE **2-5**

Sacramento County Groundwater Contour Map

Groundwater Level Trends

A review of 18 long-term hydrographs dating back into the 1960s shows a consistent pattern of water level trends through much of the basin. Groundwater elevations generally declined consistently from the mid-1960s to about 1980 on the order of 20 feet. From 1980 through 1983 water levels recovered by about 10 feet and remained stable until the beginning of the 1987 through 1992 drought. From 1987 until 1995, water levels declined by about 15 feet. From 1995 to 2000 most water levels recovered by up to 20 feet leaving them generally higher than levels prior to the 1987 through 1992 drought. Exceptions to this trend include: 1) wells in the vicinity of the City of Sacramento, which fluctuated generally less than 10 feet overall since the mid-1970s; and 2) wells in the vicinity of Rancho Cordova, which appear to have recovered less than the other wells in the subbasin since 1995 (generally less than 10 feet).

Groundwater Storage

No published calculations for subbasin storage capacity are available. However, based on available information from Olmstead and Davis (1961), DWR calculated groundwater storage capacity in the subbasin at 4,816,000 acre-feet. This was calculated by superimposing the hydrogeologic units described by Olmstead and Davis over a map of the subbasin. A planimeter was used to determine the percent coverage of each of these units in the subbasin. The specific yield values provided by Olmstead and Davis for each unit were then used to calculate an average specific yield of 6.8 percent for a depth range of 20 feet below ground surface to 310 feet below ground surface. The surface area used in that calculation was 243,200 acres.

Groundwater Budget

A groundwater model was developed for Sacramento County. (Montgomery Watson, 1993). Based on this model and subsequent data updates, Bookman-Edmonston/Navigant Consulting provided estimates of several groundwater budget components for an area generally corresponding to the South American Subbasin. The data represent an average budget for the period from 1970 to 1995. Basin inflows include natural and applied water recharge, which total 257,168 af. Subsurface inflow and outflow are not known specifically, but the model indicates that there is a net subsurface outflow of 29,676 af annually. Other groundwater outflows include annual urban extraction of 68,058 af and agricultural extraction of 162,954 af.[9]

Groundwater Management Plans (GMP) are adaptive management tools and represent a critical step in establishing a framework for maintaining a sustainable groundwater resource for the various users overlying the basins. Within these programs, a GMP will continually assess the status of the groundwater basin and make appropriate management decisions to sustain the basin. The CSCGMP in accordance with Water Code 10750 et seq. comprehensively planned for current and future uses of groundwater sources in the Central Sacramento County Groundwater Basin. The CSCGMP established a Groundwater Management Goals, and from that Basin Management Objectives (BMO) were developed. BMO's are used to help achieve groundwater basin goals. Each of the objectives consists of components that specifically address the appropriate BMO. The Monitoring Program is part of the management objective *Maintain and Improve Groundwater Quality in the Basin for the Benefit of Groundwater Users,* and the program consists of other categories required by California Water Code.

Five BMOs provide the foundation for the CSCGMP:

1) Maintain a long-term average groundwater extraction rate of 273,000 AF/year.

9 Department of Water Resources, *Bulletin 118*, updated 2/27/2004.

2) Establish specific minimum groundwater elevations within all areas of the basin consistent with the Water Forum "Solution."
3) Protect against any potential inelastic land surface subsidence.
4) Protect against any adverse impacts to surface water flows.
5) Develop specific water quality.

Maintaining the long-term average extraction component is vital to the proper management of the basin for sustainability of the basin for groundwater users. DWR Bulletin 118, as described above, gives an overall picture of the subbasin and general status of the water bearing units in the subbasin. The understanding of the Central Basin as described in the CSCGMP is current as of 2004 and under BMOs current efforts will continue to analyze and report on recent or new data. As such, new data show the Central Basin has an estimated storage capacity of approximately 350,000 acre-feet and continues to rebound and recover from previous drawdown conditions that were observed over the last few decades. Much of this recovery can be attributed to the increased use of surface water in the Central Basin, and the fallowing of previously irrigated agricultural lands transitioning into new urban development areas in accordance with the Sacramento County and City of Elk Grove General Plans.[10] The central portion of the subbasin is between Highway 99 and Highway 16, which includes FVWC's service area. Groundwater level trends in this area can be seen in the hydrographs in Figures 2-4 and 2-5. The hydrographs for these wells show groundwater levels generally varying between 40 feet above to 40 feet below mean sea level.[11]

The Water Forum Groundwater Negotiation Team (GWNT) developed an estimated long-term average annual pumping limit for each of the groundwater subbasins in Sacramento County that could meet 2030 land and water use conditions. The long-term average annual pumping limit negotiated for the Central Basin was 273,000 AF/year. "Long-term average annual pumping limit" describes the hydrogeologic process under which groundwater can be pumped over a long-term period of time and not exceed average natural recharge from streams, rainfall, and subsurface inflows. Under sustainable conditions, natural recharge can make up for variations in the amount of pumping that occurs over the long-term, given the hydrologic record from that geographic area.[12]

GWNT arrived at the sustainable yield through a complex process that requires some discussion of the technical data that was developed to support the long-term average annual pumping of 273,000 AF/year. Much of the data was based on evaluating water demands connected to future land projections and then describing those impacts associated with increased water demands. This methodology assumed that demand is met solely by groundwater and 1990 was used as the baseline conditions. Comparing these results with existing conditions resulted in a level of impacts that could be expected if groundwater pumping were increased beyond those 1990 baseline conditions.[13]

10 Sacramento Central Groundwater Authority, *Central Sacramento County Groundwater Management Plan*, March 2005, page 2-27.
11 Sacramento Central Groundwater Authority, *Central Sacramento County Groundwater Management Plan*, March 2005, page 2-29.
12 Sacramento Central Groundwater Authority, *Central Sacramento County Groundwater Management Plan*, March 2005, page 2-29.
13 Sacramento Central Groundwater Authority, *Central Sacramento County Groundwater Management Plan*, March 2005 page 2-29.

Four quantifiable elements were used to determine the level of impact:

- Water quality degradation
- Dewatering of wells
- Higher cost of pumping
- Ground subsidence

Based on these four elements, a series of groundwater model runs quantified each condition in 10-year increments, beginning in 1990 and ending in 2030. Each model run was set up to reflect future land and water use conditions; then 70 years of historical hydrologic conditions were applied to each model run to determine how the aquifer might behave under these conditions. After a comprehensive review and analysis of model data combined with real data, the GWNT concluded that using 2005 levels of groundwater pumping would provide the highest quantity of groundwater yield from the basin while minimizing impacts associated with the four elements. By interpolating between 2000 and 2010, pumping at 2005 equates to a long-term average annual pumping limit (sustainable yield) of approximately 273,000 AF/year for the Central Basin.[14]

Although FVWC was not directly involved in the preparation of the CSCGMP, the investigations did account for FVWC groundwater pumping. DWR's estimated storage capacity of 4.5 million acre-feet from Bulletin 118 for the entire South American subbasin; however, this calculation could overestimate the available groundwater and substantially minimize effects from groundwater extractions in the Central Basin portion. In addition, this methodology is inconsistent with the evaluations by the GWNT and could further conflict with the agreed upon sustainable yield of 273,000 AFA.

The following presents a conservative approach applied by the CSCGMP to evaluate the water supplies in the Central (groundwater) Basin. The sustainable yield for the Central Basin was calculated by applying the results from the model runs and real data; 2005 was determined to be the best example of sustainable pumping while minimizing the four elements that could be impacted. At capacity, FVWC pumps approximately 10.7 mgd; the average annual yield is 5,280 AFA and this is 6.3 percent of the sustainable yield of 273,000 AFA. Three new wells will replace the closed wells: consequently, the estimated net gain in pumping of roughly 700 AFA is nominal when compared to the estimated storage capacity of 350,000 AF in the Central Basin.

RELIABILITY OF SUPPLY

Water Code Section 10631

A plan shall be adopted in accordance with this chapter and shall do all of the following:

(c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable.

For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to replace that source with alternative sources or water demand management measures, to the extent practicable.

(c) Provide data for each of the following:

14 Sacramento Central Groundwater Authority, *Central Sacramento County Groundwater Management Plan*, March 2005 page 2-29.

(1) An average water year.

(2) A single dry water year.

(3) Multiple dry water years.

(k) Urban water suppliers that rely upon a wholesale agency for a source of water, shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water -year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).

Groundwater

FVWC pumps approximately 5,200 AFA from 16 wells. Well depths average 300 feet below ground surface. Groundwater is assumed to be drought resistant and for planning purposes can be relied upon under all hydrologic conditions. It should be noted that increases in local pumping during drought periods could reduce well capacities; conservation measures to curb demands would likely relieve system-wide demands. FVWC has the ability to add new groundwater supplies through development of new wells.

Supplemental Water Supplies

In an immediate emergency situation FVWC can provide additional water supplies through interties that exist between the two other adjacent water purveyors—the City of Sacramento and Cal-American. Interties are shown in Table 2-8. FVWC has established two permanent interties with the City of Sacramento. Interties 7 and 8 below are permanent connections that FVWC will use to meet customer demands throughout the year.

TABLE 2-7: FVWC INTERTIE SYSTEM

Number	Name	Owner	General Location
1	Luther Drive	City of Sacramento	Southwest
2	26th Avenue and Ethel Way	City of Sacramento	North
3	Young Street and Nina Way	City of Sacramento	North
4	Stockton Boulevard and 48th	City of Sacramento	East
5	53rd and Burdett	City of Sacramento	Southeast
6	Bowling Drive	Cal-American	South
7[a]	Sampson Blvd at Fruitridge Road	City of Sacramento	North
8[a]	Soccer Planet at 47th Avenue	City of Sacramento	Southwest

Note:
a. Proposed interties as part of the Water System Evaluation and Replacement Project
Source: Fruitridge Vista Water Company, December 2005

Reliability of Treated Water Provided by Supplemental Water Supplies

FVWC has entered into an Agreement with the City of Sacramento to purchase treated surface water. A portion of the City of Sacramento supplies will be available at all times through new interties on 47th Avenue near the Soccer Planet recreational facility and Fruitridge Road at Sampson Boulevard.

City of Sacramento

The City of Sacramento is primarily supplied with surface water from the Sacramento and American Rivers. The City diverts water pursuant to pre-1914 rights to divert 75 cubic feet per second (cfs) from the Sacramento River and secured five additional appropriative water rights with various priorities from October 1947 to September 1954. Sacramento River permit 00992 and American River permits 011358 and 011361 authorize the taking of water from the respective sources by direct diversion. The other two permits, 011359 and 011360, authorize re-diversion and consumptive uses of stored water and releases from the Upper American River Project (UARP). The City's surface water permits require use of the diverted water within the authorized Place of Use (POU). FVWC is within the City's authorized POU. Each permit has designated uses and provisions. Permits 11359 and 11361 designate a 96,000-acre area within and adjacent to the City as the POU. Permits 11358 and 11360 designate a 79,500-acre area within and adjacent to the City as the authorized POU. Permit 992 designates lands within the City of Sacramento as the authorized POU, which would include all annexations into the city limits.[15]

Additionally, the City maintains 32 groundwater wells for potable and non-potable use; 23 wells are actively used to supply drinking water. The total capacity of the wells is 33 mgd and produces up to 33,600 acre-feet per year.

In 1957, the U.S. Bureau of Reclamation (USBR) and the City executed a contract that ensures maximum entitlements through the Central Valley Project (CVP). At buildout in 2030, the USBR contract provides the City a maximum annual diversion of 326,800 AFA. This contract has no delivery limitations. The City's surface water entitlements through the permits discussed above and the USBR contractual diversions are listed in Table 2-9. As of 2010, the City is authorized to receive 205,000 AFA. Table 2-9 shows the USBR and City of Sacramento contract maximum diversion agreement amounts.

TABLE 2-8: USBR MAXIMUM CONTRACTED ANNUAL SURFACE WATER DIVERSION (AFA)

Source		2010	2015	2020	2025	2030
American River		145,700	170,200	196,200	222,200	245,000
Sacramento River		81,800	81,800	81,800	81,800	81,800
Total		227,500	252,000	248,000	304,000	326,800

Source: PBS&J, January 2011 - Adapted From The City of Sacramento USBR Contract.

Table 2-10 surface water supplies available to City of Sacramento under dry year conditions.

TABLE 2-9: 2010 ANNUAL SURFACE WATER SUPPLY (AFA)

Source	2011 USBR Contracted Supply	2011 to 2010 Dry Year Supply[a]		
		First Dry Year 2011	Second Dry Year 2009	Third Dry Year 2010
American River	136,700	50,000	50,000	50,000
American River diverted from the Sacramento River	--	86,700	91,200	95,700
Sacramento River	81,800	81,800	81,800	81,800
Total[b]	**218,500**	**218,500**	**223,000**	**227,500**

Notes:
a. Current diversion capacity from the Sacramento River is 180,000 AFY, allowing a drought year production of 230,000 AFY. Under below-Hodge conditions surface water the City of Sacramento can divert American River water from the Sacramento River diversion intake; therefore, surface water supplies are the same under all hydrologic conditions.
b. Total increases during multiple years according to USBR contract.
Source: City of Sacramento, Urban Water Management Plan, 2006

15 City of Sacramento, *Urban Water Management Plan*, November 2006, page 4-1.

California American Water Company

Cal-American, formerly Citizens Utility Company of California has water supplies available during critical shortages or in dire emergency situations. Cal-American supplies are strictly an emergency option; FVWC does neither quantify nor rely on supplies from the Cal-American system.

Summary of Reliability

Generally, reliability of water supply depends greatly on seasonal conditions or changes in climatic patterns for a region. Water supply volumes produced in average years, like that of base year 2010 were approximately 5,280 AFA. Groundwater is assumed to be drought resistant, therefore, similar water supplies volumes are considered to be available in any given year. Such that in single dry years, FVWC can expect to produce similar yields as those of previous years and this is would be consistent over multiple dry years.

The Agreement with the City of Sacramento allows FVWC to purchase 3.24 mgd of treated water supplied through two permanent interties. The Agreement does allow for system-wide cutbacks under certain hydrologic conditions, although for planning purposes FVWC assumes a firm capacity of 3.24 mgd. In dire emergencies additional supplies are available from Cal-American. No annual quantities are available because this source would only be used on rare occasions and it is not considered into the Company's firm water supply portfolio. See RT 21& 22.

Table 2-11 summarizes historic data of available water for the area from each water supply source for normal water year, single dry water year, and multiple dry water years.

Water Year Data

Table 2-12 shows the water year types used as a basis for analysis in this UWMP as illustrated on page 15 of the DWR 2005 Guidebook to Assist Water Suppliers in the preparation of an UWMP.

TABLE 2-10: 2010 SUPPLY RELIABILITY (AFA)

Water Source	Normal Year	Single Dry Year	Multiple Dry Years		
			Year 1	Year 2	Year 3
Groundwater[a]	5,280	5,280	5,280	7,236[a]	7,236[a]
City of Sacramento Treated Water (3.24 mgd)[b]	3,629	3,629	3,629	3,629	3,629
Cal-American[c]	0	0	0	0	0
Percent of Normal (%)		**100%**	**100%**	**100%**	**100%**

Notes:
a. Groundwater assumed to be drought resistant and reliable under all hydrological conditions. A well reduction factor of 1.56 discounts the pumping capacity for operational limitations that reduce the capabilities of the well to produce the maximum annual yield. For planning purposes this assumes 650 gpm (Boyle Engineering, Water System Evaluation, December 2005) or 2,015 AFA with 1.56 well reduction factor from new wells 18, 19 and 20 - actual daily and annual capacity may differ as wells come online. (Well reduction factor provided by PBS&J)
b. The Agreement with City of Sacramento allows FVWC to draw 2250 gpm flow pro rata or 3.24 mgd. This is termed as "firm capacity" although is subject to reductions under certain hydrologic conditions. It is reasonable to assume, based on City of Sacramento supply reliability during those declared droughts that 3.24 mgd is available in all years. [Sacramento can divert American River Water from the Sacramento River, if flow restrictions exist on the Lower American River].
c. Cal-American supplies are utilized in emergency situations only; therefore, this is not included as a permanent supply source.
Source: Fruitridge Vista Water Company, July 2010.

TABLE 2-11: TYPES OF WATER YEARS	
Water Year Type	**Base Year(s)**
Normal Water Year[a]	2001 - 2005
Single Dry Year	1976 - 1977
Multiple Dry Years	1987 - 1992

a. Average of five years of pumping data with A well reduction factor 1.56 discounts the pumping capacity for operational limitations that reduce the capabilities of the wells to produce the maximum annual yield.
Source: Fruitridge Vista Water Company, July 2010.

Water Code Section 10631

(d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

Transfer and Exchange Opportunities

FVWC does not at this time have any transfer or exchange opportunities with other local agencies. Staff does not anticipate any future potential water transfers or exchange agreements. However, in the event that the need occurs an agreement could be negotiated with the City of Sacramento or Cal-American, assuming each party is interested in pursuing this type of water supply contract.

Water Code Section 10631(i)

(i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

Desalination

FVWC does not have access to ocean water and thus cannot participate in ocean desalination as a source of supply. Additionally, the aquifer it overlies does not contain brackish groundwater and thus FVWC cannot participate in brackish groundwater desalination as a source of supply.

Water Code Section 10631

(e) (1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses:

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(2) Agricultural.

(3) The water use projections shall be in the same five-year increments described in subdivision (a).

TABLE 12 - Past, Current and Projected Water Deliveries

	2005				2010			
	metered		unmetered		metered		unmetered	
Water Use Sectors	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY
Single family	170	159	4,019	3,756	170	135	4,019	3,188
Multi-family	441	412	41	38	461	366	21	17
Commercial					60	48		
Industrial								
Institutional/gov					28	22		
Landscape					6	5		
Agriculture								
C I I	88	82	0	0				
Total	699	653	4,060	3,794	725	575	4,040	3,204

TABLE12 (continued) - Past, Current and Projected Water Deliveries

	2015				2020			
	metered		unmetered		metered		unmetered	
Water Use Sectors	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY
Single family	1,310	872	3,130	2,084	2,720	1,480	2,000	1,088
Multi-family	542	361			662	360		
Commercial	60	40			60	33		
Industrial								
Institutional/gov	28	19			28	15		
Landscape	6	4			6	3		
Agriculture								
C I I								
Total	1,946	1,296	3,130	2,084	3,476	1,891	2,000	1,088

TABLE12 (continued) - Past, Current and Projected Water Deliveries

	2025				2030			
	metered		unmetered		metered		unmetered	
Water Use Sectors	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY
Single family	5,000	2,195			5,000	2,195		
Multi-family	782	343			782	343		
Commercial	60	26			60	26		
Industrial								
Institutional/gov	28	12			28	12		
Landscape	6	3			6	3		
Agriculture								
other								
Total	5,876	2,580	0	0	5,876	2,580	0	0

NOTE: This is a very rough estimate. Since we are not metered and do not have an elaborate billing system it is impossible to know many of these figures for certain.

Water Use by Customer Type – Past, Current and Future

FVWC categorizes its water accounts into three broad customer categories based on connection type: Single-family (3/4" – 1.0" meters), multiple family (>1" meters), and large lot (>10,000 ft^2), which includes commercial light industrial and institutional and irrigation/landscape along with sales to Sacramento County and Southgate Parks and Recreation District.

Current Water Demand

There are approximately 727 metered and 4,000 unmetered, flat-rate services, which equates to approximately 4,947 AFA of demand throughout the Company's service area. This includes the wholesale quantities delivered to Sacramento County. Water use varies through the years depending on several natural factors such as weather, extension of seasons, etc. For example, rainier-than-usual winters in Fiscal Years 2004/05 and 2005/2006 reduced the need for landscape irrigation and decreased water usage when compared to normal or dry years. Water use is also dependent on other factors such as business climate and economy. Long-term general trends in water requirements are valuable in projecting future supply needs.

Residential Sector

In the FVWC service area, single-family residential customers average 3.5 persons per connection. Total system per capita water use averages about 261 gpcd. According to FVWC staff, some growth is expected in the residential sector over the next five to ten years; staff projects approximately 500 new connections in the near term and another 550 new connections by 2020. If current land use prevails, staff estimate buildout would be achieved in 2020. Additionally, Sacramento County has designated part of the service area for re-development, at this time, no firm connections are known in these re-development areas.

According to law, all new homes as of January 1, 1992 are metered and those customers pay a uniform metered rate. The increasing efficiencies in residential landscaping, ultra-low flow toilets (required by recent County Codes), and conservation education programs from FVWC significantly help to minimize the water demand of new customers. Additional funding and approvals are required from the CPUC for FVWC to fully implement programs needed to increase the water use efficiencies of existing, pre-1992 customers.

Commercial Sector (large lot)

FVWC has a complex mix of commercial customers, ranging from specialty stores, insurance offices, beauty shops, gas stations, shopping centers, restaurants, and other facilities serving the South Sacramento area. This sector has stabilized and no significant increases in water demand are expected in the near future.

Industrial Sector (large lot)

FVWC has a small industrial sector, primarily centered on food production, freight/trucking and light manufacturing. The industrial sector has grown slightly in the last five years but is expected to remain constant in the near future, with the exception of Campbell's Soup and the SMUD Cogeneration Plant and potential development of industrial land in the southwest section of the service area.

Institutional/Governmental Sector (large lot)

Currently, FVWC has a stable institutional/governmental sector, primarily schools, churches and local government.

Landscape/Recreational Sector (large lot)

Landscape and recreational demands at the parks are expected to remain constant in the near future.

Agricultural Sector

FVWC does not have an agricultural sector.

Water demand by user type is shown in Table 2-13.

Sales to Other water Agencies

FVWC is mainly a retail water purveyor. Sacramento County purchases water from FVWC for one subdivision and irrigation purposes.

System Losses

Water loss within the FVWC's distribution system can occur from various causes such as leaks, breaks, malfunctioning valves and the difference between the actual and measured quantities stemming from water meter inaccuracies. Other losses are associated with water main and hydrant flushing, tests of fire suppression systems and system maintenance or repairs.

Ninety-five percent of public water distribution systems experience losses between 7 and 15 percent.[16] The routine losses experienced by FVWC's water distribution system (excluding the periodic loss of wells) are not known. Losses presented in this UWMP are based solely on an acceptable industry standard of ten (10) percent. However, as stated above it is likely that actual losses would be similar to system losses experienced by similar water systems in urban areas. This also assumes that system losses occur between the wellhead pump and FVWC's end-users; therefore, system losses are a function of demand. Accordingly, as demands increase, so do unaccounted for losses. Table 2-14 shows the 10 percent system losses associated with customer demands.

It should be noted that FVWC suffered a system capacity and pressure loss when four wells were taken out of service due to groundwater contamination from MTBE and PCE.

Current and Planned water supply projects

FVWC's water supply comes mainly from local groundwater supplies, and two auxiliary wholesale providers, the City of Sacramento and Cal-American (see Table 2-15). Recent groundwater contamination impacted several of the existing wells, capital projects are underway that would help maintain and potentially increase its water supply. A water system evaluation was conducted in December 2005. The evaluation studied the capacity problems associated with loss of contaminated wells and offered a number of alternatives along with recommendations necessary to improve system-wide reliability and to maintain required distribution flow pressures. Additionally, the evaluation included new interties with existing water purveyors, City of Sacramento and/or Cal-American. The funding sources for the

16 American Water Works Association, Water Resource Planning; Manual of Water Supply Practices M50, 2001, page 33.

TABLE 2-12: UN-ACCOUNTED FOR SYSTEM LOSSES (AFA)

	2010	2015	2020	2025	2030
Demands (Table 2-13)	3779	3379	2979	2580	2580
10% Unaccounted-for system losses[a]	378	378	298	258	258

Notes:
a. Actual unaccounted-for-system losses are unknown, FVWC assumes an acceptable industry standard of 10% losses.
Source: Fruitridge Vista Water Company, July 2010.

TABLE 2-13: WATER SYSTEM PROJECT SUPPLIES (AFA)

Water Supply Sources	2010	2015	2020	2025	2030
Local Groundwater[a]	2,015[b]	2,015[b]	2,015[b]	2,015[b]	2,015[b]
City of Sacramento (3.24 mgd)[c]	3,629	3,629	3,629	3,629	3,629
Total	**5,644**	**5,644**	**5,644**	**5,644**	**5,644**

Notes:
a. Groundwater is assumed to be drought resistant and is reliable in under all hydrologic conditions.
b. 3,145 AFA estimated pumping from new wells (18,19, and 20) from MD:AD ratio and dividing by that 1.56 ratio. A well reduction factor of 1.56 discounts the pumping capacity for operational limitations that reduce the capabilities of the well to produce the maximum annual yield. For planning purposes this assumes 650 gpm (Boyle Engineering, Water System Evaluation, December 2005) or 2,015 AFA with 1.56 well reduction factor from new wells - actual daily and annual capacity may differ as wells come online. (Well reduction factor provided by PBS&J)
c. The Agreement with City of Sacramento allows FVWC to draw 2,250 gpm flow pro rata or 3.24 mgd. This is termed as "firm capacity" although is subject to reductions under certain hydrologic conditions. It is reasonable to assume, based on City of Sacramento supply reliability during those declared droughts that 3.24 mgd is available in all years. [Sacramento can divert American River Water from the Sacramento River, if flow restriction exist on the Lower American River]
Source: Fruitridge Vista Water Company, July 2010.

TABLE 2-14: WATER SYSTEM PROJECTED SUPPLIES (AFA)

Water Supply Sources	2015	2020	2025	2030	2035
Local Groundwater[a]	2,015[b]	2,015[b]	2,015[b]	2,015[b]	2,015[b]
City of Sacramento (3.24 mgd)[c]	3,629	3,629	3,629	3,629	3,629
Total	**5,644**	**5,644**	**5,644**	**5,644**	**5,644**

Notes:
a. Groundwater is assumed to be drought resistant and is reliable in under all hydrologic conditions.
b. 3,145 AFA estimated pumping from new wells (18,19, and 20) from MD:AD ratio and dividing by that 1.56 ratio. A well reduction factor of 1.56 discounts the pumping capacity for operational limitations that reduce the capabilities of the well to produce the maximum annual yield. For planning purposes this assumes 650 gpm (Boyle Engineering, Water System Evaluation, December 2005) or 2,015 AFA with 1.56 well reduction factor from new wells - actual daily and annual capacity may differ as wells come online. (Well reduction factor provided by PBS&J)
c. The Agreement with City of Sacramento allows FVWC to draw 2,250 gpm flow pro rata or 3.24 mgd. This is termed as "firm capacity" although is subject to reductions under certain hydrologic conditions. It is reasonable to assume, based on City of Sacramento supply reliability during those declared droughts that 3.24 mgd is available in all years. [Sacramento can divert American River Water from the Sacramento River, if flow restriction exist on the Lower American River]
Source: Fruitridge Vista Water Company, July 2010.

proposed projects consist of funds from the State Drinking Water Treatment and Research Fund (DWTRF), which funds MTBE impacted water systems and from other State loan/grant programs available to FVWC, in this case the State Revolving Fund, new connections and FVWC.

The results of the evaluation formed the basis of the Water System Project that is currently underway. The Water System Project consists of three new wells and two new interties with the City of Sacramento. The Agreement with City of Sacramento provides for 3.24 mgd or approximately 3,629 AFA.

No other supply projects are currently planned.

SECTION 3 – DEMAND MANAGEMENT MEASURES (DMM)

DETERMINATION OF DMM IMPLEMENTATION

Water Code Section 10631

(f) *Provide a description of the supplier's water demand management measures. This description shall include all of the following:*

(1) *A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:*

(A) *Water survey programs for single-family residential and multifamily residential customers.*

(B) *Residential plumbing retrofit.*

(C) *System water audits, leak detection, and repair.*

(D) *Metering with commodity rates for all new connections and retrofit of existing connections.*

(E) *Large landscape conservation programs and incentives.*

(F) *High-efficiency washing machine rebate programs.*

(G) *Public information programs.*

(H) *School education programs.*

(I) *Conservation programs for commercial, industrial, and institutional accounts.*

(J) *Wholesale agency programs.*

(K) *Conservation pricing.*

(L) *Water conservation coordinator.*

(M) *Water waste prohibition.*

(N) *Residential ultra-low-flush toilet replacement programs.*

(g) *An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:*

(1) *Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.*

(2) *Include a cost-benefit analysis, identifying total benefits and total costs.*

(3) *Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.*

(4) *Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.*

(j) *Urban water suppliers that are members of the California Urban Water Conservation Council and submit annual reports to that council in accordance with the "Memorandum of*

Understanding Regarding Urban Water Conservation in California," dated September 1991, may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g).

FVWC, as a privately owned water utility, has the legal authority to implement demand management measures. This authority has been demonstrated through past implementation of demand management measures. As a commitment to implementing economically feasible programs, FVWC will promote efficient water use and will continue to implement demand management measures wherever practicable.

In this capacity, the Company is a member agency of the RWA in Sacramento County, each member agency supports the water supply planning and conservation efforts put forth by the RWA. In terms of conservation, the RWA recently established a Water Efficiency Program (WEP). The WEP, on a regional scale consists of significant programs and services designed to help local water purveyors implement BMPs. The WEP mission statement is "to educate regional water users about the need for efficient use of water and promote water awareness through programs and services to better manage our limited water resources."[17] To meet the needs of its members, the WEP consists two categories of BMPs:

Category 1: the core program provides regional water efficiency services utilizing widespread marketing for the benefit of many members.

- Category 1 BMPs – BMP 6 Landscape Water Conservation for Commercial, Institutional and Industrial and Multiple-Family Developments;[18] BMP 7 Public Outreach; BMP 8 School Education; BMP 12 Landscape Water Conservation for Single-Family Homes.

Category 2: a subscription program offering additional "pay for services", beyond Category 1 services.

- Category 2 BMPs: BMP 3 Distribution System Water Audits, Leak Detection and Repair; BMP 5 Large Landscape Water Audits & Incentive for Commercial, Institutional and Industrial and Irrigation Accounts; BMP 6 Clothes Washer Incentives;[19] BMP 9 Commercial, Industrial and Institutional Water Conservation; BMP 16 Ultra-Low Flush Toilet Replacement Program for Non-Residential Customers.

Table 3-1 summarizes the Company's Demand Management Measures and programs that are currently in place.

17 Regional Water Authority, Final 2007 Annual Report, Water Efficiency Program, page 1.

18 Regional Water Authority, *Final 2007 Annual Report, Water Efficiency Program*, page 26. Note: BMP 6 is listed in both Categories 1 and 2. The Water Forum Agreement of 2000 identified BMP 6 as Landscape Water Conservation for Commercial, Institutional and Industrial and Multiple-Family Developments as opposed to BMP 6: High-Efficiency Washing Machine Rebate Program of CUWCC and DWR UWMP Guidelines. The Water Efficiency Program employs both BMPs.

19 Regional Water Authority, *Final 2007 Annual Report, Water Efficiency Program*, page 26. Note: BMP 6 is listed in both Categories 1 and 2. The Water Forum Agreement of 2000 identified BMP 6 as Landscape Water Conservation for Commercial, Institutional and Industrial and Multiple-Family Developments as opposed to BMP 6: High-Efficiency Washing Machine Rebate Program of CUWCC and DWR UWMP Guidelines. The Water Efficiency Program employs both BMPs.

TABLE 3-1: DEMAND MANAGEMENT MEASURES	
Demand Management Measure	**Program Implementation**
Water survey programs	See DMM-A
Residential plumbing retrofit	See DMM-B
System water audits, leak detection, and repair	X
Metering with commodity rates for all new connections	Partial[a]
Large landscape conservation programs	X
High-efficiency washing machine rebate programs	See DMM-F
Public information programs	RWA member
School education programs	RWA member
Conservation programs for commercial, industrial and institutional customers	X
Wholesale agency programs	Not Applicable
Conservation pricing	Partial[a]
Water Conservation Coordinator position	X
Water waste prohibition	X
Residential ultra-low-flush toilet replacement programs	See DMM-N

Notes:
a. Partial Implementation – new customers are metered. Rates are set by the CPUC; these are not commodity rates.
b. DMM not Implemented Evaluation required as of 2005 UWMP.

DMM-A: Water Survey Programs for Residential Customers

- **IMPLEMENTATION**: FVWC is an investor-owned utility regulated by the CPUC; as such, the CPUC approved service rates cannot support those costs associated with water audits; therefore, water surveys are not part of the approved operating budget.
- **IMPLEMENTATION SCHEDULE**: At this time, FVWC has neither staff nor funding resources to fully implement DMM A. FVWC remains hopeful that in the future these resources will be available to implement DMM A.
- **METHODS TO EVALUATE DMM EFFECTIVENESS**: At this time, FVWC has neither staff nor funding resources to analyze DMM A. FVWC remains hopeful that in the future these resources will be available to thoroughly analyze DMM A.
- **CONSERVATION SAVINGS**: Not Evaluated.

DMM-B: Residential Plumbing Retrofit

- **IMPLEMENTATION**: The FVWC service area is approximately 95 percent developed with homes developed before 1992. The cost to distribute plumbing retrofit kits is estimated to be near $25 per connection. FVWC is an investor-owned utility regulated by the CPUC; as such, the CPUC approved service rates cannot support those costs associated with residential plumbing retrofits; therefore, implementation of DMM B is not part of the approved operating budget.
- **IMPLEMENTATION SCHEDULE**: At this time, FVWC has neither staff nor funding resources to fully implement DMM B. FVWC remains hopeful that in the future these resources will be available to implement DMM B.
- **METHODS TO EVALUATE DMM EFFECTIVENESS**: At this time, FVWC has neither staff nor funding resources to analyze DMM B. FVWC remains hopeful that in the future these resources will be available to thoroughly analyze DMM B.
- **CONSERVATION SAVINGS**: Not Evaluated. Alternatively, "passive conservation" (residential plumbing improvements) installed by homeowners or landlords in existing

residences will contribute to some water savings throughout the Company's service area.

DMM-C: System Water Audits, Leak Detection, and Repair

- **IMPLEMENTATION**: FVWC has a continuous distribution system water audit program in place. Ongoing analysis of unaccounted for water is one of the most effective means to achieve conservation by reducing leaks from the system. Actual losses are unknown, for water supply planning purposes this UWMP uses an acceptable industry standard of 10 percent. Actual losses may vary between 7 and 15 percent. All FVWC system-wide leaks are repaired in a timely manner. Customers are notified to conduct a repair whenever it appears possible that leaks exist on the customer's side of the meter. FVWC staff continually monitors leak repairs to ensure losses are minimized.
- FVWC also conducts an annual valve exercise program in an attempt to ensure that all main line valves in the distribution system are accessible and operating properly (i.e., not leaking). FVWC has six connections with adjacent utilities and the valve inspection of these connections is part of the valve exercise program. After completion of the upcoming capacity replacement project FVWC will inspect these new valves and connections as well.
- In coordination with the Sacramento Metropolitan Fire Department, FVWC complied with recent amendments to California Code of Regulations Title 19, Division 1, Chapter 9, pertaining to standardization of fire hydrants and associated fire protection equipment. This effort helped to further reduce water losses,
- **METHODS TO EVALUATE DMM EFFECTIVENESS**: The Company keeps records of the number and type of leaks reported annually. The continuous review of the system allows FVWC to maintain unaccounted for water losses within an industry acceptable range on 7 to 15 percent.
- **IMPLEMENTATION SCHEDULE**: FVWC will continue to implement DMM C.
- **CONSERVATION SAVINGS**: The total amount of water conserved over the five- year period by implementing this DMM will be directly related to the percentage of unaccounted for water loss leaving the system. FVWC seeks to maintain an acceptable 10.0 percent or less unaccounted for water. Actual system losses could vary.

DMM-D: Metering with Commodity Rates for New Connections and retrofit (meter installation) of existing customers

- **IMPLEMENTATION**: FVWC, as of 2011 has a customer base of primarily flat rate customers (4,200) and the balance (774) is metered connections. All new services as of January 1, 1992 are metered and the rates are based upon water consumption.
- FVWC has a CPUC approved uniform rate structure for billing units on metered services along with an associated monthly service charge. A billing unit is one hundred cubic feet (748 gallons), commonly abbreviated HCF or CCF. See Appendix F for Rate Structure Information as established by CPUC.
- **IMPLEMENTATION SCHEDULE**: Ongoing - FVWC will continue to conduct its meter retrofit program. All connections will have meters installed by 2025. In addition, FVWC will continue to require and read meters on new services as shown in Table 3-2.
- **METHODS TO EVALUATE EFFECTIVENESS**: Periodic review of customer water use, by comparing current water use with historical data.

TABLE 3-2: DMM D - METERING WITH COMMODITY RATES FOR ALL NEW CONNECTIONS AND RETROFIT OF EXISTING CONNECTIONS - ACTUAL					
Year program started	**2006**	**2007**	**2008**	**2009**	**2010**
# of unmetered accounts	3,997	3,982	3,802	3,858	3,962
# of retrofit meters installed	0	0	0	0	0
# of accounts without commodity rates	3,997	3,982	3,802	3,858	3,962
Actual expenditures	$0.00	$0.00	$0.00	$0.00	$0.00
Actual water savings – AF/Y	Unknown	Unknown	Unknown	Unknown	Unknown
Source: Fruitridge Vista Water Company, July 2011.					

- **CONSERVATION SAVINGS**: Metered accounts may result in up to 12 percent reduction in demand compared to non-metered accounts.
- **BUDGET**: Meter installation costs are absorbed by FVWC, as the CPUC does not yet allow direct recovery of these costs from the customer.

DMM-E: Large Landscape Conservation

- **IMPLEMENTATION**: FVWC has ten large landscape irrigation accounts. Currently, four accounts are owned and operated by the Southgate Recreation and Park District, four accounts with CalTrans and Sacramento City Unified School District has two accounts. Landscape surveys are conducted on a case-by-case basis and water conservation suggestions will be provided. FVWC could present water conservation information to help the park district, CalTrans and the school district improve water uses at public landscapes and greenbelts.
- **IMPLEMENTATION SCHEDULE**: FVWC will continue to implement DMM E.
- **METHODS TO EVALUATE EFFECTIVENESS:** Annual review of customers' water use and offering on-site follow-up evaluations to customers whose total water use exceeds their total annual water budget.
- **CONSERVATION SAVINGS**: Landscapes that implement conservation suggestions based on FVWC recommendations could result in a 5 percent reduction in water demand on those customers.

DMM-F: High Efficiency Clothes Washer Rebate

RWA and Sacramento Municipal Utility District initiated a pilot clothes water rebate program. The goal of the 2007 pilot program was to provide SMUD customers an additional financial incentive by applying $50.00 (or $75.00) rebate from their water service provider or agency.

- **IMPLEMENTATION**: FVWC is an investor-owned utility regulated by the CPUC; as such, the CPUC approved service rates cannot support those costs associated with rebate programs; therefore, the approved operating budget does not allow implementation of this rebate program.
- **IMPLEMENTATION SCHEDULE**: At this time, FVWC has neither staff nor funding resources to thoroughly implement DMM A. FVWC remains hopeful that in the future these resources will be available to implement DMM F as part of the WEP.

- **METHODS TO EVALUATE DMM EFFECTIVENESS**: At this time, FVWC has neither staff nor funding resources to analyze DMM F. FVWC remains hopeful that in the future these resources will be available to thoroughly analyze DMM F.
- **CONSERVATION SAVINGS**: Not Evaluated, although published information shows high efficiency clothes washers use 40-50 percent less water per cycle and consume up to 60 percent less energy.

DMM-G & H: Public Information and School Education Programs

- **IMPLEMENTATION**: **PUBLIC INFORMATION**: FVWC distributes information to the public about water saving programs and conservation measures through bi-monthly bill messages. In addition, monthly water bills are designed to show water used over the last billing period with a summary of water usage by each billing period for the previous year.
- The annual Consumer Confidence Report (Appendix G) presents additional information about water quality, conservation measures and the current water shortage alert program.
- **IMPLEMENTATION SCHEDULE**: Ongoing - FVWC will continue to implement DMM G through direct mail and participation in the RWA WEP.
- **METHODS TO EVALUATE DMM EFFECTIVENESS**: At this time, there is no method to accurately determine the effectiveness of DMM G.
- **CONSERVATION SAVINGS**: Currently, there is no method to accurately quantify water conservation savings from DMM G. Incremental savings may occur as customers reduce daily demands. The Company hopes that more public education through the WEP will curb demands in its service area.
- **IMPLEMENTATION SCHOOL EDUCATION PROGRAMS**: Ongoing - FVWC currently supports and participates in the RWA WEP
- **IMPLEMENTATION SCHEDULE**: Ongoing – FVWC will continue to participate in the RWA WEP; the Great Water Mystery is one of the school education programs currently in place.
- **METHODS TO EVALUATE DMM EFFECTIVENESS**: At this time, there is no method to accurately determine the effectiveness of DMM H.
- **CONSERVATION SAVINGS**: Currently, there is no method to accurately quantify water conservation savings from DMM H. Incremental savings may occur as customers reduce daily demands.

DMM-I: Conservation Programs for Commercial and Industrial Accounts

- **IMPLEMENTATION**: FVWC has metered nearly all commercial and industrial accounts. All meters will be checked every two months during the manual billing meter readings for leaks and/or abnormally high water usage. A visual audit is conducted at the property for leaks, potential water wasting activities, then repairs are ordered, and customers are provided with water-saving recommendations.
- **IMPLEMENTATION SCHEDULE**: Ongoing - FVWC will continue to implement DMM I at the levels described above.

- **METHODS TO EVALUATE EFFECTIVENESS**: Target high-end water users by conducting water audits.
- **CONSERVATION SAVINGS:** The Company currently has no method to quantify water conservation savings from DMM I.

DMM-J: Wholesale Agency Program

- **IMPLEMENTATION**: (NOT APPLICABLE) - FVWC does not serve any wholesale customers. FVWC provides retail water service to residential, commercial, and industrial customers only.

DMM-K: Conservation Pricing

- **IMPLEMENTATION**: FVWC has a rate structure for all customer sectors determined by the CPUC. Residential services prior to January 1, 1992 are flat rate services subject to monthly flat rates based on lot size. All new residential, commercial, public and industrial connections are metered and rates are uniform based on water consumption. FVWC is an investor owned utility regulated by the CPUC and that agency determines the Company's rates. See Appendix F for Rate Structure Information.
- **IMPLEMENTATION SCHEDULE**: Ongoing - FVWC will continue to implement DMM K
- **METHODS TO EVALUATE EFFECTIVENESS**: Target high-end water users by conducting water audits.
- **CONSERVATION SAVINGS**: The Company currently has no method to quantify water conservation savings from DMM K.

DMM-L: Conservation Coordinator

- **IMPLEMENTATION**: FVWC established the position of Water Conservation Coordinator in 1993. FVWC has an AWWA certified water conservation coordinator that is responsible for its water conservation programs.

Name:	Beth Arnoldy
Title:	Water Conservation Coordinator
Address:	1108 Second Street, Suite 204 Sacramento, CA 95814
Phone:	916-443-2607
Fax:	916-443-3271
E-mail:	barnoldy@fruitridgevista.com

In addition, other Company staff support conservation efforts through enforcement and monthly billing mailers.

- **IMPLEMENTATION SCHEDULE**: Ongoing - FVWC will continue to support the efforts of the Conservation Coordinator.
- **METHODS TO EVALUATE EFFECTIVENESS**: At this time, there is no method to accurately determine the effectiveness of DMM L. The Company hopes that participation in the WEP will help to reduce demands throughout its service area.
- **CONSERVATION SAVINGS**: Currently, there is no method to accurately quantify water conservation savings from DMM L. Incremental savings may occur as customers alter their uses and curb daily demands.

DMM-M: Water Waste Prohibition

- **IMPLEMENTATION**: Some of FVWC's water waste prohibitions are: exterior irrigation restrictions; corrective requirements for leaks, breaks or malfunctions; car, boat, building and mobile home washing restrictions; non-self service commercial car wash restrictions; ornamental fountains restrictions; restrictions on the washing of sidewalks and driveways; restrictions on filling of swimming pools; and restrictions on the use of potable water for dust control purposes. FVWC currently restricts customers to an odd/even irrigation schedule between May 1 to November 1 of each year.
- **IMPLEMENTATION SCHEDULE**: Ongoing - FVWC will continue to implement DMM M.
- **METHODS TO EVALUATE EFFECTIVENESS**: Annual tracking of enforcement actions and recording violations.
- **CONSERVATION SAVINGS:** The Company currently has no method to quantify water conservation savings from DMM M.

DMM-N: Residential Ultra-Low Flow Toilet Replacement Programs

- **IMPLEMENTATION**: FVWC is an investor-owned utility regulated by the CPUC; as such, the CPUC approved service rates cannot support those costs associated with replacement or rebate programs; therefore, DMM N is not part of the approved operating budget.
- **IMPLEMENTATION SCHEDULE**: At this time, FVWC has neither staff nor funding resources to fully implement DMM N. FVWC remains hopeful that in the future these resources will be available to implement DMM N.
- **METHODS TO EVALUATE EFFECTIVENESS**: At this time, FVWC does not have either staff or funding resources to analyze DMM N. FVWC remains hopeful that in the future these resources will be available to thoroughly analyze DMM N.
- **CONSERVATION SAVINGS**: Currently, because FVWC has not implemented this DMM, the Company has no means to quantify water conservation savings associated with DMM N. Published information shows ultra-low flush toilets can save more than 60 percent per flush over pre-1983 toilets and high efficiency toilets (HET) use 1.2 gallons per flush, and averages 20 percent less water than standard 1.6 gallon per flush toilets Some HET have dual-flush mechanisms for either liquids or solids.

DMM Conclusion

FVWC has implemented or participated in cost effective programs that comply with many Demand Management Measures, and intends to continue to do so in the future. If funding sources are available, FVWC will pursue additional DMM's to promote responsible water supply stewardship in their service area.

In order to pursue the goals of the various DMM's adopted by FVWC, it is imperative that FVWC be granted rates providing for recovery of all costs associated with implementing the DMM's, including conservation programs, joint programs with other purveyors, or plumbing retrofits, etc. In the event of revenue lost due to specific metered deliveries and construction water sales, this revenue would be offset with rate adjustments.

SECTION 4 – WATER SHORTAGE CONTINGENCY PLAN

Water Code Section 10632

The plan shall provide an urban water shortage contingency analysis that includes each of the following elements that are within the authority of the urban water supplier:

(a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.

(h) A draft water shortage contingency resolution or ordinance. FVWC does not have an ordinance but adheres to the water shortage contingency plan listed in this section.

(i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

Table 4-1 shows the five stages that have been adopted by FVWC in developing a water shortage contingency plan. The Company's two water sources are groundwater and purchased surface water. Rationing stages may be triggered by a shortage in one source or a combination of sources. Because stages overlap, the triggers stated herein could automatically implement the more restrictive Stage, unless the less restrictive Stage provides the appropriate actions. Shortages may trigger a change in stage at any time.

TABLE 4-1: STAGES OF ACTION IN RESPONSE TO WATER SUPPLY SHORTAGES

Stage No.	Percent Shortage
1	25%
2	35%
3	45%
4	50% or greater

Source: Fruitridge Vista Water Company, July 2010.

STAGES OF ACTION

Stage 1: Loss of Twenty-five percent (25%) of Normal Water Supply

Definition: The FVWC is able to meet all of the water demands of its customers in the near future.

Standard conservation measures are in place in an effort to prevent waste, over-watering and runoff. Standard measures include public awareness reminders and adhering to specified prohibitions and requirements:

1) Water is to be used for beneficial and useful purposes only. All unnecessary and wasteful uses of water are prohibited.

   A. Restaurants are asked to serve water to customers only upon specific request.

   B. Washing down of sidewalks, driveways, parking lots or other paved surfaces is prohibited except to alleviate immediate fire or sanitation hazards.

2) Free-flowing hoses are prohibited for all uses, including vehicle and equipment washing, ponds, and evaporative coolers. Automatic shut-off devices shall be installed on any hose or other large-volume filling apparatus in use.

3) Leaking consumer pipes or faulty sprinklers shall be repaired within five (5) days or less if warranted by the severity of the problem.

4) All pools, spas, and ornamental fountains/ponds shall be equipped with recirculation pumps and shall be constructed to be leak-proof. Pool draining and refilling shall be allowed only for health, maintenance or structural considerations.

Stage 2: Water Shortage Alert - Thirty-five percent (35%) Loss of Normal Water Supply

Definition: There is a possibility that the FVWC supply or distribution system will not be able to meet all the normal water demands of its customer.

Triggering Action – 35% Water Loss: Manager's recommendation to the Corporation will support an action declaring need for additional conservation steps due to water loss.

In addition, to steps 1 through 4 in Stage 1, the following steps will be taken:

1) Landscape irrigation shall be limited to a maximum of three days per week when necessary based on the following odd-even schedule.
   A. Customers with street addresses that end with odd numbers may irrigate only on Tuesdays, Thursdays, and Saturdays.
   B. Customers with street addresses that end with even numbers may irrigate only on Wednesdays, Fridays, and Sundays.
   C. No irrigation is permitted on Mondays.
   D. Automatic sprinkler system timers shall be set to operate only during off-peak hours between 12:01 a.m. and 6:00 a.m.

2) Washing of streets, parking lots, driveways, sidewalks, or buildings is prohibited except as necessary for health, sanitary, or fire protection purposes.

3) Restaurants shall serve water only upon request.

Stage 3: Water Shortage Crisis - Forty-five percent (45%) Loss of Normal Water Supply

Definition: The FVWC's supply or distribution system probably would not be able to meet all normal water demands of its customers.

Triggering Action - 45% Water Loss: Manager's recommendations to the Corporation to consider implementing Stage 3 water shortage contingency measures.

The following changes are made to the irrigation schedules in step 5 and adds steps 8, 9, and 10.

1) Landscape irrigation shall be limited to a maximum of two days per week only when necessary based on the following odd-even schedule.
   A. Customers with street addresses that end with odd numbers may irrigate only on Tuesdays and Saturdays.
   B. Customers with street addresses that end with even numbers may irrigate only on Wednesdays and Sundays.

C. No irrigation is permitted on Mondays, Thursdays, and Fridays.

2) No potable water from the utility's system shall be used to fill or refill new swimming pools, artificial lakes, ponds, or streams until the water crisis is over. Water use for ornamental ponds and fountains is prohibited.

3) Washing of automobiles or equipment shall be done on the lawn or at a commercial establishment that uses recycled or reclaimed water.

Stage 4: Water Shortage Emergency - 50 percent (50%) Loss of Normal Water Supply

Definition: FVWC experiences a major water supply shortage or major failure within its supply or distribution system.

Triggering Action - 50% Water Loss: Manager recommends the Corporation act to implement Stage 4 steps and Stage 5, if necessary.

Changes are made to step 8 and steps 11, 12, 13, and 14 are added:

1) Landscape irrigation shall be limited to a maximum of one day per week when necessary based on the following odd-even schedule.

   A. Customers with street addresses that end with odd numbers may irrigate only on Saturdays.

   B. Customers with street addresses that end with even numbers may irrigate only on Sundays.

   C. No irrigation is permitted on Mondays, Tuesdays, Wednesdays, Thursdays, and Fridays.

2) Flushing of fire hydrants is prohibited except in case of emergency and for essential operations.

3) No potable water shall be sold to customers outside the FVWC service area.

4) New connection to the FVWC's system will not be allowed.

Stage 5 – Beyond 50% Loss of Water Production

All of the above measures are implemented as applicable and adds 15 to prohibit all landscape irrigation.

1) Landscape irrigation shall not be allowed.

Water Code Section 10632 (d-f)

(d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.

(e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

(f) Penalties or charges for excessive use, where applicable.

PROHIBITIONS, PENALTIES AND CONSUMPTION REDUCTION METHODS

Currently FVWC does not have PUC approval to assess penalties. (See attached Tariff Rule 14.1) If we were granted approval in the future we would implement a program as outlined below. FVWC will place prohibitions on various wasteful water uses such as fire hydrant use restrictions; exterior irrigation restrictions; requirements for correction of leaks, breaks or malfunctions within a user's plumbing system; car, boat, building, and mobile home washing restrictions; non-self service commercial car wash restrictions; ornamental fountains restrictions; restrictions on the washing of sidewalks and driveways; restriction on filling of swimming pools; and restrictions on use of potable water for dust control purposes.. Table 4-2 presents the types of mandatory water use prohibitions and the supply reduction stage when the prohibitions go into effect.

TABLE 4-2: MANDATORY PROHIBITIONS AT EACH SUPPLY REDUCTION STAGES

Prohibition	Stage When Prohibition Becomes Mandatory
Potable water used for beneficial and useful purposes only	Stage 1
Free-flowing hoses are prohibited for all uses	Stage 1
Pool draining and refilling shall be allowed only for health, maintenance or structural considerations	Stage 1
Landscape irrigation shall be limited to a maximum of three days per week: No irrigation is permitted on Mondays	Stage 2
Restaurants shall serve water only upon request	Stage 2
Landscape irrigation shall be limited to a maximum of two days per week. No irrigation is permitted on Mondays, Thursdays, and Fridays.	Stage 3
Using potable water to fill or refill swimming pools, artificial lakes, ponds or streams	Stage 3
Washing of automobiles or equipment shall be done on the lawn or at a commercial establishment that uses recycled or reclaimed water	Stage 3
Landscape irrigation shall be limited to a maximum of one day per week. No irrigation is permitted on Mondays, Tuesdays, Wednesdays, Thursdays, and Fridays.	Stage 4
Flushing of fire hydrants is prohibited except in case of emergency	Stage 4
No potable water shall be sold to customers outside the FVWC service area	Stage 4
New connection to the FVWC's system will not be allowed	Stage 4
Landscape Irrigation	Stage 5

Water Code Section 10632 (b)

(b) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.

Table 4-3 shows the water supply available over the next three years based on the single worst dry year period of 1976-1977.

Water Code Section 10632 (c)

(c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster

TABLE 4-3: WATER SUPPLY OVER NEXT THREE YEARS [1976-1977 SINGLE WORST DRY YEAR] (AFA)				
		2011	**2009**	**2010**
Groundwater[a]		5,280	5,280	7,236[b]
City of Sacramento Treated Water (3.24 mgd)[c]		3,630	3,630	3,630
Cal-American[d]		0	0	0
Total Supply		**8,743**	**8,743**	**10,866**
Percent of Normal (%)		**100%**	**100%**	**100%**

Notes:
a. Groundwater is assumed to be drought resistant and is reliable in under all hydrologic conditions. Average Annual of 5,280 AFA calculated from MD:AD ratio and dividing by that 1.56 ratio. A well reduction factor of 1.56 discounts the pumping capacity for operational limitations that reduce the capabilities of the well to produce the maximum annual yield.
b. For planning purposes this assumes 650 gpm (Boyle Engineering, Water System Evaluation, December 2005) or 2,015 AFA with 1.56 well reduction factor from new wells 18, 19 and 20 - actual daily and annual capacity may differ as wells come online. (Well reduction factor provided by PBS&J)
c. The Agreement with City of Sacramento allows FVWC to draw 2250 gpm flow pro rata or 3.24 mgd. This is termed as "firm capacity" although s subject to reductions under certain hydrologic conditions. It is reasonable to assume, based on City of Sacramento supply reliability during those declared droughts that 3.24 mgd is available in all years. [Sacramento can divert American River Water from the Sacramento River, if flow restriction exist on the Lower American River]
d. Cal-American supplies are utilized in emergency situations only; therefore, this is not included as a permanent supply source.
Source: Fruitridge Vista Water Company, July 2010.

CATASTROPHIC SUPPLY INTERRUPTION PLAN

Contamination to the Water Supply

The water supply can become contaminated in a number of ways: organisms such as *Giardia* and *Cryptosporidium* can contaminate water supplies and cause waterborne diseases; there may be contamination due to leaking underground storage tanks (LUST); or there may be intentional contamination through terrorism, vandalism or sabotage. A vulnerability assessment would determine that this system is highly vulnerable to the last two types of contamination.

In the event of contamination the following actions shall be initiated:

- Estimate the contaminated area and predict movement of contamination;
- Isolate portions of the system containing suspect water;
- Issue "Boil Water", "Do Not Drink", or "Do Not Use" orders and other press releases as appropriate;
- Initiate appropriate stage of Water Shortage Contingency Plan; and/or finally,
- In the event the Company cannot meet customer demands the manager would need to authorize a temporary increase of the auxiliary supplies with the City of Sacramento or have approval to open the emergency connections with Cal-American.

Regional Power Outage

Fruitridge Vista Water Company's Vulnerability Assessment identified a power outage as a significant threat to its system. The devastating effect of major natural disasters on power systems can cause widespread outages over a long period of time. Windstorms, flooding and earthquakes can take down power lines and interrupt service.

FVWC has standby generators at Wells 14, 16 and 17. New generators are in place at for Wells 18, 19 and 20. Repair or replacement of the electrical equipment control panels and wiring could be accomplished within 24 hours.

In the event of a power outage the following steps shall be initiated:

- Obtain the estimated down time from SMUD;
- Initiate backup power;
- Increase disinfectant residual;
- Issue "Boil Water", "Do Not Drink", or "Do Not Use" orders and press releases as appropriate;
- Initiate appropriate stage of Water Shortage Contingency Plan; and/or finally
- In the event the Company cannot meet customer demands the manager would need to authorize a temporary increase of the auxiliary supplies with the City of Sacramento or have approval to open the emergency connections with Cal-American.

Earthquake

Earthquakes can and have been very destructive to water utility systems in California. Heavy damage results from loss of power to ruptured pumping stations and displacement of soil causing broken lines, cracks in concrete storage tanks and structural damage. Connection pipes can break due to movement; pump and motor housings can be damaged from groundshaking events. In the event of an earthquake the following steps shall be initiated:

- Initiate backup power;
- Increase disinfectant residual;
- Issue "Boil Water", "Do Not Drink", or "Do Not Use" orders and press releases as appropriate;
- Initiate appropriate stage of Water Shortage Contingency Plan; and/or
- In the event the Company cannot meet customer demands the manager would need to authorize a temporary increase of the auxiliary supplies with the City of Sacramento or have approval to open the emergency connections with Cal-American.

Water Code Section 10632 (g)

(g) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

(h) *See RT 31*

Analysis of Revenue Impacts of Reduced Sales During Shortages

In the event of a water shortage scenario, company revenues may decrease from the implementation of conservation measures and corresponding reduction in water sales. Conversely, expenses will increase as a result of the implementation and enforcement of water conservation measures. Expenditures will also rise on a per-unit basis, as wholesalers increase their per-unit price to compensate for the loss of revenue from wholesale sales. FVWC has several options to address financial issues during a water shortage. FVWC would work with the CPUC to coordinate an emergency rate structure to compensate for any loss in revenues and/or recover any emergency expenses.

SECTION 5 – RECYCLED WATER PLAN

Water Code Section 10633

The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

COORDINATION AND RECYCLED WATER USES

Sacramento County is conducting a feasibility study on potential conjunctive uses of recycled water from the wastewater treatment plant in Elk Grove. The study is examining the feasibility of operating groundwater recharge facilities and providing recycled water for landscape irrigation in communities that are plumbed to receive treated effluent. At the present time, FVWC's service area is geographically distanced from the proposed recycled water facilities site and would not benefit from this program until a conveyance system is brought into the area. Perhaps if this recycled program expands to include all areas of the County, the Company could participate in this system.

SECTION 5 – RECYCLED WATER PLAN

Water Code Section 10633

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COORDINATION AND RECYCLED WATER USES

At the present time, FVWC's service area is geographically distanced from the proposed recycled water facilities site and would not benefit from this program until a conveyance system is brought into the area. Perhaps if this recycled program expands to include all areas of the County, the Company could participate in this system.

See 9L 495, RT 33, RT 37, 9L 561-2, RT 38

SECTION 6 – WATER QUALITY IMPACTS ON RELIABILITY

Water Code Section 10634

The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631,and the manner in which water quality affects water management strategies and supply reliability.

GROUNDWATER QUALITY LOCAL AND CENTRAL SACRAMENTO COUNTY GROUNDWATER BASIN

Characterization

Local groundwater is typically considered a calcium-magnesium-bicarbonate or magnesium-calcium-bicarbonate type. Other minor groundwater types include sodium-calcium-bicarbonate or calcium-sodium-bicarbonate in the vicinity of Elk Grove and a magnesium-sodium-bicarbonate or sodium-magnesium-bicarbonate near the confluence of the Sacramento and American rivers (Bertoldi and others 1991). Total Dissolved Solids (TDS) range from 24 – 581 mg/l and averages 221 mg/l based on 462 records (Montgomery Watson 1993).[20]

Local Impairments for Fruitridge Vista Water Company

Historically, FVWC had sufficient groundwater supplies to meet demands; however, in 1998 groundwater Well 11 was contaminated by the gasoline additive MTBE. Two new wells were installed to replace the loss of Well 11. Wells 1, 2, and 12, located in the northeast section of the FVWC water service area were also contaminated by MTBE and Well 12 also exhibited PCE contamination. FVWC took the wells offline due to the contamination. California Department of Health Services, now Department of Public Health, sent FVWC Compliance Order 01-09-05-CO-002 on August 29, 2005. New wells added to the system are mitigating past problems regarding water quality; future impairments could occur due to contaminant transport in the groundwater basin – FVWC can shut down impaired wells and increase pumping at other wells.

City of Sacramento's Source Water Quality

The purpose of this section is to discuss the quality of the City of Sacramento's surface water and groundwater supplies, and the potential impacts water quality may have on supply reliability to FVWC. Water quality for each of the City's sources of supply and its potential impact on reliability are discussed below.

Surface Water Quality

In May of 1991, the City, Sacramento County Water Resources Division, and the Sacramento Regional County Sanitation District (SRCSD) formed the Sacramento Coordinated Water Quality Monitoring Program (CMP). Since 1992, the CMP has monitored long-term ambient water quality in both the Sacramento and American Rivers. The latest water quality results from December 1992 to June 2003, show that water in both rivers consistently meet applicable water quality regulations.

The City of Sacramento diverts surface water from the Sacramento and American Rivers. Surface water quality can be influenced by a combination of factors, including higher turbidity during storm events, irrigated agricultural areas, livestock, urban runoff, and contamination due to other point sources. These influencing factors can impact water quality parameters (e.g., turbidity, coliforms, Giardia and Cryptosporidium, organic carbon, volatile and semi-volatile organic compounds, arsenic, and hexavalent chromium). However, raw water quality is routinely monitored by the City, and the water treatment plants are designed to produce drinking water that meets all applicable drinking water quality regulations. The City does not expect any surface water supply changes prior to 2030 due to water quality.

20 Department of Water Resources, *Bulletin 118*, update, 2/27/04.

Sacramento Groundwater Water Quality

Groundwater underlying the City's service area generally meets primary and secondary drinking water standards for municipal water use, and is described as being a calcium-magnesium-bicarbonate type water, with minor fractions of sodium-magnesium-bicarbonate. Due to high concentrations of iron and manganese in the lower aquifer system, the upper aquifer system is usually the preferred source of municipal groundwater supply.

The lower aquifer system also contains higher concentrations of TDS than the upper aquifer. The TDS concentration in most wells is within secondary drinking water standards, but varies quite significantly throughout the area (from 21 to 657 mg/L, with an overall average of 221 mg/L). TDS concentrations exceed 2,000 mg/L at depths of approximately 1,200 feet or greater. However, most wells do not extend into this poorer quality groundwater. There are also over 200 leaking underground storage tank (LUST) sites and several "principal" groundwater contaminant plumes near the City.

Montgomery Watson (1997) listed seven sites within the subbasin with significant groundwater contamination. Included in the list are three USEPA Superfund sites – Aerojet, Mather Field, and the Sacramento Army Depot. Other sites are the Kiefer Boulevard Landfill, an abandoned PG&E site on Jiboom Street near Old Sacramento, the Southern Pacific and Union Pacific Railyards in downtown Sacramento. Principal contamination plumes associated with those listed sites are the former Southern Pacific and Union Pacific Railyards (located about a half mile west of the Capitol Building), McClellan Air Force Base (AFB), the former Mather AFB, and the Aerojet site in Rancho Cordova.

The combined primary contaminants of concern from these sites include: benzene; methyl-tertiary butyl ether (MTBE); trichloroethene (TCE); tetrachloroethene (PCE); cis-1,2-dichloroethene (DCE); 1,4-dioxane; 1,2-dichloroethane; carbon tetrachloride; perchlorate; and n-nitrosodimethylamine (NDMA). In addition to ambient water quality or potential contaminants, the City's groundwater supply is also subject to future regulation. Future regulations regarding arsenic, radon, or other chemicals of concern could potentially limit the City's groundwater supply in the future. The City is participating in several groups to help develop mechanisms to manage and protect the Sacramento area's groundwater resources. There is no information available which identifies any groundwater supply changes prior to 2030 due to water quality.

Table 6-1 shows the current and potential water supply changes due to water quality.

TABLE 6-1: CURRENT AND PROJECTED WATER SUPPLY CHANGES DUE TO WATER QUALITY (AFA)

Supply Source		2010	2015	2020	2025	2030
City of Sacramento[a]		3,630	3,630	3,630	3,630	3,630
Local Groundwater[b]		7,236	7,236	7,236	7,236	7,236
Total		**10,866**	**10,866**	**10,866**	**10,866**	**10,866**
Percent of Normal (%)		100%	100%	100%	100%	100%

Notes:
a. "Firm Capacity" is subject to reductions under certain hydrologic conditions. It is reasonable to assume, based on City of Sacramento supply reliability during those declared droughts that 3.24 mgd is available in all years. [Sacramento can divert American River Water from the Sacramento River, if flow restriction exist on the Lower American River]
b. Local wells impacted by MTBE reduced 2005 production capacity; new wells added to the system will help to overcome future impairments. Source See Table 2-3, page 11 of this UWMP. For planning purposes this assumes 650 gpm (Boyle Engineering, Water System Evaluation, December 2005) or 2,015 AFA with 1.56 well reduction factor from new wells 18, 19 and 20 - actual daily and annual capacity may differ as wells come online. (Well reduction factor provided by PBS&J).
Source: Fruitridge Vista Water Company, July 2010.

SECTION 7 – WATER SERVICE RELIABILITY

Water Code Section 10635

(a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

(b) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

(c) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service. (d) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

PROJECTED NORMAL WATER YEAR SUPPLY AND DEMAND

Water demand projections for FVWC were developed using an "End Use" model. Two main steps are involved in developing an End Use model: (1) Establishing base-year water demand at the end-use level (such as toilets, showers) and calibrating the model to initial conditions; and (2) Forecasting future water demand based on future demands of existing water service accounts and future growth in the number of water service accounts.

Establishing the base-year water demand at the end-use level is accomplished by breaking down total historical water use for each type of water service account; (single family (3/4"-1" meter), multiple family (>1.0" meter), and large lot (>10,000 ft^2) to specific end uses (such as toilets, faucets, showers, and irrigation).

Forecasting future water demand is accomplished by determining the growth in the number of water service accounts. Once these rates of change were determined, they were input into the spreadsheet and applied to those accounts and their end water uses.

Tables 7-1 through 7-3 present a comparison of projected normal supplies to projected normal water use over the next 20 years in 5-year increments.

As shown in the three tables, supply is projected to be sufficient to meet demand out to 2030. Anticipated growth is projected to add approximately 1,050 new connections or roughly 400 AFA; estimated water supplies will adequately meet these increased demands. In the event of a supply cutback FVWC would be able to increase groundwater pumping to meet any reasonably anticipated deficiencies from other sources, thus supply is projected to be sufficient to meet demand to 2030.

Projected Single-Dry-Year Supply and Demand Comparison

Tables 7-4 through 7-5 present a comparison of projected single-dry year water supply to projected single-dry year water use over the next 20 years in 5-year increments.

TABLE 7-1: PROJECTED NORMAL WATER YEAR SUPPLY (AFA)						
Supply Source		**2010**	**2015**	**2020**	**2025**	**2030**
City of Sacramento[a]		3,630	3,630	3,630	3,630	3,630
Cal-American		0	0	0	0	0
Local Groundwater[b]		7,236	7,236	7,236	7,236	7,236
Recycled Water		0	0	0	0	0
Total		**10,866**	**10,866**	**10,866**	**10,866**	**10,866**
Percent of Normal Year (%)		100%	100%	100%	100%	100%

Notes.
a. "Firm capacity" is subject to reductions under certain hydrologic conditions. It is reasonable to assume, based on City of Sacramento supply reliability during those declared droughts that 3.24 mgd is available in all years. [Sacramento can divert American River Water from the Sacramento River, if flow restriction exist on the Lower American River].
b. Groundwater assumed to be drought resistant and reliable under all hydrological conditions. A well reduction factor of 1.56 discounts the pumping capacity for operational limitations that reduce the capabilities of the well to produce the maximum annual yield. Source See Table 2-3, page 11 of this UWMP. For planning purposes this assumes 650 gpm (Boyle Engineering, Water System Evaluation, December 2005) or 2,015 AFA with 1.56 well reduction factor from new wells 18, 19 and 20 - actual daily and annual capacity may differ as wells come online. (Well reduction factor provided by PBS&J)
Source: Fruitridge Vista Water Company, July 2010.

TABLE 7-2: PROJECTED NORMAL WATER YEAR DEMAND[a,b,c] (AFA)						
		2010	**2015**	**2020**	**2025**	**2030**
Demand		6,160	6,160	6,609	6,609	6,609
Percent of Normal Demand (%)		100%	100%	100%	100%	100%

Notes:
a. Estimated 5,600 AFA assumes 550 EDU near-future connections, Boyle Engineering, Water System Evaluation December 2005, Page 3.
b. Buildout assumed to occur in 2020; 6,008 AFA with a total of 1,050 new connections.
c. Buildout includes an additional 1,050 EDU's - this assumes no Sacramento County rezoning of service area to higher housing densities.
d. Water System Evaluation, Boyle Engineering Estimated demands 2005 of 4,818 AFA.
Source: Fruitridge Vista Water Company, July 2010.

TABLE 7-3: PROJECTED NORMAL YEAR SUPPLY AND DEMAND COMPARISON (AFA)						
		2010	**2015**	**2020**	**2025**	**2030**
Supply total		10,866	10,866	10,866	10,866	10,866
Demand total		6,160	6,160	6,609	6,609	6,609
Difference (supply minus demand)		4,706	4,706	4,257	4,257	4,257
Difference as % of Supply		43%	43%	39%	39%	39%
Difference as % of Demand		76%	76%	64%	64%	64%

Notes:
a. With supplemental supplies of 3.24 mgd from City of Sacramento, FVWC can meet forecasted demands without voluntary or mandatory rationing. This assumes no Sacramento County rezoning of FVWC service area to higher housing densities. If higher densities connections do occur future implementation of conservation programs can help alleviate system-wide demand pressures.
Source: Fruitridge Vista Water Company, July 2010.

TABLE 7-4: PROJECTED SINGLE DRY YEAR WATER SUPPLY (AFA)					
Supply		**2010**	**2015**	**2020**	**2025**
City of Sacramento[a]		3,630	3,630	3,630	3,630
Local Groundwater[b]		7,236	7,236	7,236	7,236
Recycled Water		0	0	0	0
Total		**10,866**	**10,866**	**10,866**	**10,866**
Percent of projected normal (%)		100%	100%	100%	100%

Notes:
a. "Firm capacity" is subject to reductions under certain hydrologic conditions. It is reasonable to assume, based on City of Sacramento supply reliability during those declared droughts that 3.24 mgd is available in all years. [Sacramento can divert American River Water from the Sacramento River, if flow restrictions exist on the Lower American River].
b. Groundwater assumed to be drought resistant and reliable under all hydrological conditions. A well reduction factor of 1.56 discounts the pumping capacity for operational limitations that reduce the capabilities of the well to produce the maximum annual yield. For planning purposes this assumes 650 gpm (Boyle Engineering, Water System Evaluation, December 2005) or 2,015 AFA with 1.56 well reduction factor from new wells 18, 19 and 20 - actual daily and annual capacity may differ as wells come online. (Well reduction factor provided by PBS&J)
Source: Fruitridge Vista Water Company, July 2011.

TABLE 7-5: PROJECTED SINGLE DRY YEAR WATER DEMAND [a,b,c] (AFA)					
		2010	2015	2020	2025
Demand		6,160	6,160	6,609	6,609
Percent of projected normal (%)		100%	100%	100%	100%

Notes:
a. Estimated 5,600 AFA assumes 550 EDU near-future connections, Boyle Engineering, Water System Evaluation December 2005, Page 3.
b. Buildout assumed to occur in 2020; 6,008 AFA with a total of 1,050 new connections.
c. Buildout includes an additional 1,050 EDU's - this assumes no Sacramento County rezoning of service area to higher housing densities.
d. Water System Evaluation, Boyle Engineering Estimated demands 2005 of 4,818 AFA.
Source: Fruitridge Vista Water Company, July 2010.

TABLE 7-6: PROJECTED SINGLE DRY YEAR SUPPLY AND DEMAND COMPARISON (AFA)					
		2010	2015	2020	2025
Supply totals		10,866	10,866	10,866	10,866
Demand totals		6,160	6,160	6,608	6,608
Difference (supply minus demand)		4,706	4,706	4,257	4,257
Difference as % of Supply		43%	43%	39%	39%
Difference as % of Demand		76%	76%	64%	64%

Notes:
a. With supplemental supplies of 3.24 mgd from City of Sacramento, FVWC can meet forecasted demands without voluntary or mandatory rationing. This assumes no Sacramento County rezoning of FVWC service area to higher housing densities. If higher densities connections do occur future implementation of conservation programs can help alleviate system-wide demand pressures.
Source: Fruitridge Vista Water Company, July 2010.

Although a decrease in availability of groundwater pumping could occur during a single dry year, groundwater is assumed to be drought tolerant; therefore, supply from groundwater is unchanged under dry year conditions. If groundwater supplies were reduced due to dry year conditions, auxiliary supplies from the City of Sacramento[21] would be used to balance any service area shortfalls to meet customer demands. In addition, implementation of demand management (conservation) programs could help to alleviate potential supply deficiencies and reduce system-wide demands prior to mandatory cutbacks.

Projected Multiple-Dry-Year Supply and Demand Comparison

Tables 7-7 through 7-21 presents an analysis of water supply reliability for FVWC based on a three-year dry year period, projected out 20 years in 5-year increments. For each five-year period, the three-year dry period is assumed to occur in the last three years of the period.

2007 through 2011 – Multiple Dry Year Evaluation

TABLE 7-7: PROJECTED SUPPLY DURING MULTIPLE DRY YEAR PERIOD ENDING IN 2011 (AFA)					
Supply	**2007**	**2011**	**2009**	**2010**	**2011**
City of Sacramento[a]	3,630	3,630	3,630	3,630	3,630
Local Groundwater[b]	5,280	5,280	5,280	7,236	7,236
Recycled water	0	0	0	0	0
Total	**8,910**	**8,910**	**8,910**	**10,866**	**10,866**
Percent of projected normal (%)	100%	100%	100%	100%	100%

Notes.
a. "Firm capacity" is subject to reductions under certain hydrologic conditions. It is reasonable to assume, based on City of Sacramento supply reliability during those declared droughts that 3.24 mgd is available in all years. [Sacramento can divert American River Water from the

21 The City of Sacramento Agreement allocates 3.24 mgd or 3,630 AFA.

Sacramento River, if flow restrictions exist on the Lower American River].
b. Groundwater assumed to be drought resistant and reliable under all hydrological conditions. A well reduction factor of 1.56 discounts the pumping capacity for operational limitations that reduce the capabilities of the well to produce the maximum annual yield. For planning purposes this assumes 650 gpm (Boyle Engineering, Water System Evaluation, December 2005) or 2,015 AFA with 1.56 well reduction factor from new wells 18, 19 and 20 - actual daily and annual capacity may differ as wells come online. (Well reduction factor provided by PBS&J)
Source: Fruitridge Vista Water Company, July 2010.

TABLE 7-8: PROJECTED DEMAND MULTIPLE DRY YEAR PERIOD ENDING IN 2011[a,b,c] (AFA)

	2007	2011	2009	2010	2011
Demand	4,892	6,160	6,160	6,160	6,160
Percent of projected normal (%)	100%	100%	100%	100%	100%

Notes:
a. Estimated 5,600 AFA assumes 550 EDU near-future connections, Boyle Engineering, Water System Evaluation December 2005, page 3.
b. Buildout assumed to occur in 2020; 6,008 AFA with a total of 1,050 new connections.
c. Buildout includes an additional 1,050 EDU's - this assumes no Sacramento County rezoning of FVWC's service area to higher housing densities.
Source: Fruitridge Vista Water Company, July 2011.

TABLE 7-9: PROJECTED SUPPLY AND DEMAND COMPARISON DURING MULTIPLE DRY YEAR PERIOD ENDING IN 2011 (AFA)

	2007	2011	2009	2010	2011
Supply Total	8,910	8,910	8,910	10,866	10,866
Demand total	4,892	6,160	6,160	6,160	6,160
Difference (supply minus demand)	3,959	2,690	2,690	4,706	4,706
Difference as % of Supply	45%	30%	30%	43%	43%
Difference as % of Demand	81%	44%	44%	76%	76%

Notes:
a. With supplemental supplies of 3.24 mgd from City of Sacramento, FVWC can meet forecasted demands without voluntary or mandatory rationing. This assumes no Sacramento County rezoning of FVWC service area to higher housing densities. If higher densities connections do occur future implementation of conservation programs can help alleviate system-wide demand pressures.
Source: Fruitridge Vista Water Company, July 2011.

2011 through 2015 – Multiple Dry Year Evaluation

TABLE 7-10: PROJECTED SUPPLY DURING MULTIPLE DRY YEAR PERIOD ENDING IN 2015 (AFA)

Supply	2011	2012	2013	2014	2015
City of Sacramento[a]	3,630	3,630	3,630	3,630	3,630
Local Groundwater[b]	7,236	7,236	7,236	7,236	7,236
Recycled water	0	0	0	0	0
Total	**10,866**	**10,866**	**10,866**	**10,866**	**10,866**
Percent of projected normal (%)	100%	100%	100%	100%	100%

Notes.
a. "Firm capacity" is subject to reductions under certain hydrologic conditions. It is reasonable to assume, based on City of Sacramento supply reliability during those declared droughts that 3.24 mgd is available in all years. [Sacramento can divert American River Water from the Sacramento River, if flow restrictions exist on the Lower American River].
b. Groundwater assumed to be drought resistant and reliable under all hydrological conditions. A well reduction factor of 1.56 discounts the pumping capacity for operational limitations that reduce the capabilities of the well to produce the maximum annual yield. For planning purposes this assumes 650 gpm (Boyle Engineering, Water System Evaluation, December 2005) or 2,015 AFA with 1.56 well reduction factor from new wells 18, 19 and 20 - actual daily and annual capacity may differ as wells come online. (Well reduction factor provided by PBS&J)
Source: Fruitridge Vista Water Company, July 2010.

TABLE 7-11: PROJECTED DEMAND MULTIPLE DRY YEAR PERIOD ENDING IN 2015[a,b,c] (AFA)

	2011	2012	2013	2014	2015
Demand	6,160	6,160	6,160	6,160	6,160
Percent of projected normal (%)	100%	100%	100%	100%	100%

Notes:
a. Estimated 5,600 AFA assumes 550 EDU near-future connections, Boyle Engineering, Water System Evaluation December 2005, Page 3.
b. Buildout assumed to occur in 2020; 6,008 AFA with a total of 1,050 new connections.
c. Buildout includes an additional 1,050 EDU's - this assumes no Sacramento County rezoning of service area to higher housing densities.
Source: Fruitridge Vista Water Company, July 2010.

TABLE 7-12: PROJECTED SUPPLY AND DEMAND COMPARISON DURING MULTIPLE DRY YEAR PERIOD ENDING IN 2015 (AFA)

	2011	2012	2013	2014	2015
Supply Total	10,866	10,866	10,866	10,866	10,866
Demand total	6,160	6,160	6,160	6,160	6,160
Difference (supply minus demand)	4,706	4,706	4,706	4,706	4,706
Difference as % of Supply	43%	43%	43%	43%	43%
Difference as % of Demand	76%	76%	76%	76%	76%

Note:
a. With supplemental supplies of 3.24 mgd from City of Sacramento, FVWC can meet forecasted demands without voluntary or mandatory rationing. This assumes no Sacramento County rezoning of FVWC service area to higher housing densities. If higher densities connections do occur future implementation of conservation programs can help alleviate system-wide demand pressures.
Source: Fruitridge Vista Water Company, July 2010.

2016 through 2020 – Multiple Dry Year Evaluation

TABLE 7-13: PROJECTED SUPPLY DURING MULTIPLE DRY YEAR PERIOD ENDING IN 2020 (AFA)

Supply	2016	2017	2018	2019	2020
City of Sacramento[a]	3,630	3,630	3,630	3,630	3,630
Local Groundwater[b]	7,236	7,236	7,236	7,236	7,236
Recycled water	0	0	0	0	0
Total	**10,866**	**10,866**	**10,866**	**10,866**	**10,866**
Percent of projected normal (%)	100%	100%	100%	100%	100%

Notes.
a. "Firm capacity" is subject to reductions under certain hydrologic conditions. It is reasonable to assume, based on City of Sacramento supply reliability during those declared droughts that 3.24 mgd is available in all years. [Sacramento can divert American River Water from the Sacramento River, if flow restrictions exist on the Lower American River].
b. Groundwater assumed to be drought resistant and reliable under all hydrological conditions. A well reduction factor of 1.56 discounts the pumping capacity for operational limitations that reduce the capabilities of the well to produce the maximum annual yield. For planning purposes this assumes 650 gpm (Boyle Engineering, Water System Evaluation, December 2005) or 2,015 AFA with 1.56 well reduction factor from new wells 18, 19 and 20 - actual daily and annual capacity may differ as wells come online. (Well reduction factor provided by PBS&J)
Source: Fruitridge Vista Water Company, July 2010.

TABLE 7-14: PROJECTED DEMAND MULTIPLE DRY YEAR PERIOD ENDING IN 2020 [a,b,c] (AFA)

	2016	2017	2018	2019	2020
Demand	6,160	6,160	6,160	6,160	6,609
Percent of projected normal (%)	100%	100%	100%	100%	100%

Notes:
a. Estimated 5,600 AFA assumes 550 EDU near-future connections, Boyle Engineering, Water System Evaluation December 2005, Page 3.
b. Buildout assumed to occur in 2020; 6,008 AFA with a total of 1,050 new connections.
c. Buildout includes an additional 1,050 EDU's - this assumes no Sacramento County rezoning of service area to higher housing densities.
Source: Fruitridge Vista Water Company, July 2010.

TABLE 7-15: PROJECTED SUPPLY AND DEMAND COMPARISON DURING MULTIPLE DRY YEAR PERIOD ENDING IN 2020 – (AFA)

	2016	2017	2018	2019	2020
Supply Total	10,866	10,866	10,866	10,866	10,866
Demand total	6,160	6,160	6,160	6,160	6,609
Difference (supply minus demand)	4,706	4,706	4,706	4,706	4,257
Difference as % of Supply	43%	43%	43%	43%	39%
Difference as % of Demand	76%	76%	76%	76%	64%

Note:
a. With supplemental supplies of 3.24 mgd from City of Sacramento, FVWC can meet forecasted demands without voluntary or mandatory rationing. This assumes no Sacramento County rezoning of FVWC service area to higher housing densities. If higher densities connections do occur future implementation of conservation programs can help alleviate system-wide demand pressures.
Source: Fruitridge Vista Water Company, July 2010.

2021 through 2025 – Multiple Dry Year Evaluation

TABLE 7-16: PROJECTED SUPPLY DURING MULTIPLE DRY YEAR PERIOD ENDING IN 2025 (AFA)

Supply	2021	2022	2023	2024	2025
City of Sacramento[a]	3,630	3,630	3,630	3,630	3,630
Local Groundwater[b]	7,236	7,236	7,236	7,236	7,236
Recycled water	0	0	0	0	0
Total	**10,866**	**10,866**	**10,866**	**10,866**	**10,866**
Percent of projected normal (%)	100%	100%	100%	100%	100%

Notes.
a. "Firm capacity" is subject to reductions under certain hydrologic conditions. It is reasonable to assume, based on City of Sacramento supply reliability during those declared droughts that 3.24 mgd is available in all years. [Sacramento can divert American River Water from the Sacramento River, if flow restrictions exist on the Lower American River].
b. Groundwater assumed to be drought resistant and reliable under all hydrological conditions. A well reduction factor of 1.56 discounts the pumping capacity for operational limitations that reduce the capabilities of the well to produce the maximum annual yield. For planning purposes this assumes 650 gpm (Boyle Engineering, Water System Evaluation, December 2005) or 2,015 AFA with 1.56 well reduction factor from new wells 18, 19 and 20 - actual daily and annual capacity may differ as wells come online. (Well reduction factor provided by PBS&J)
Source: Fruitridge Vista Water Company, July 2010.

TABLE 7-17: PROJECTED DEMAND MULTIPLE DRY YEAR PERIOD ENDING IN 2025 [a,b,c] (AFA)

	2021	2022	2023	2024	2025
Demand	6,609	6,609	6,609	6,609	6,609
Percent of projected normal (%)	100%	100%	100%	100%	100%

Notes:
a. Estimated 5,600 AFA assumes 550 EDU near-future connections, Boyle Engineering, Water System Evaluation December 2005, Page 3.
b. Buildout assumed to occur in 2020; 6,008 AFA with a total of 1,050 new connections.
c. Buildout includes an additional 1,050 EDU's - this assumes no Sacramento County rezoning of service area to higher housing densities.
Source: Fruitridge Vista Water Company, July 2010.

TABLE 7-18: PROJECTED SUPPLY AND DEMAND COMPARISON DURING MULTIPLE DRY YEAR PERIOD ENDING IN 2025 (AFA)

	2021	2022	2023	2024	2025
Supply Total	10,866	10,866	10,866	10,866	10,866
Demand total	6,609	6,609	6,609	6,609	6,609
Difference (supply minus demand)	4,257	4,257	4,257	4,257	4,257
Difference as % of Supply	39%	39%	39%	39%	39%
Difference as % of Demand	64%	64%	64%	64%	64%

Notes:
a. With supplemental supplies of 3.24 mgd from City of Sacramento, FVWC can meet forecasted demands without voluntary or mandatory rationing. This assumes no Sacramento County rezoning of FVWC service area to higher housing densities. If higher densities connections do occur future implementation of conservation programs can help alleviate system-wide demand pressures.
Source: Fruitridge Vista Water Company, July 2010.

2026 through 2030 – Multiple Dry Year Evaluation

TABLE 7-19: PROJECTED SUPPLY DURING MULTIPLE DRY YEAR PERIOD ENDING IN 2025 (AFA)

Supply	2026	2027	2028	2029	2030
City of Sacramento[a]	3,630	3,630	3,630	3,630	3,630
Local Groundwater[b]	7,236	7,236	7,236	7,236	7,236
Recycled water	0	0	0	0	0
Total	**10,866**	**10,866**	**10,866**	**10,866**	**10,866**
Percent of projected normal (%)	100%	100%	100%	100%	100%

Notes.
a. "Firm capacity" is subject to reductions under certain hydrologic conditions. It is reasonable to assume, based on City of Sacramento supply reliability during those declared droughts that 3.24 mgd is available in all years. [Sacramento can divert American River Water from the Sacramento River, if flow restrictions exist on the Lower American River].
b. Groundwater assumed to be drought resistant and reliable under all hydrological conditions. A well reduction factor of 1.56 discounts the pumping capacity for operational limitations that reduce the capabilities of the well to produce the maximum annual yield. For planning purposes this assumes 650 gpm (Boyle Engineering, Water System Evaluation, December 2005) or 2,015 AFA with 1.56 well reduction factor from new wells 18, 19 and 20 - actual daily and annual capacity may differ as wells come online. (Well reduction factor provided by PBS&J)
Source: Fruitridge Vista Water Company, July 2010.

TABLE 7-20: PROJECTED DEMAND MULTIPLE DRY YEAR PERIOD ENDING IN 2025 [a,b,c] (AFA)

	2026	2027	2028	2029	2030
Demand	6,609	6,609	6,609	6,609	6,609
Percent of projected normal (%)	100%	100%	100%	100%	100%

Notes:
a. Estimated 5,600 AFA assumes 550 EDU near-future connections, Boyle Engineering, Water System Evaluation December 2005, Page 3.
b. Buildout assumed to occur in 2020; 6,008 AFA with a total of 1,050 new connections.
c. Buildout includes an additional 1,050 EDU's - this assumes no Sacramento County rezoning of service area to higher housing densities.
Source: Fruitridge Vista Water Company, July 2010.

TABLE 7-21: PROJECTED SUPPLY AND DEMAND COMPARISON DURING MULTIPLE DRY YEAR PERIOD ENDING IN 2030 (AFA)

	2026	2027	2028	2029	2030
Supply Total	10,866	10,866	10,866	10,866	10,866
Demand total	6,609	6,609	6,609	6,609	6,609
Difference (supply minus demand)[a]	4,257	4,257	4,257	4,257	4,257
Difference as % of Supply	39%	39%	39%	39%	39%
Difference as % of Demand	64%	64%	64%	64%	64%

Note:
a. With supplemental supplies of 3.24 mgd from City of Sacramento, FVWC can meet forecasted demands without voluntary or mandatory rationing. This assumes no Sacramento County rezoning of FVWC service area to higher housing densities. If higher densities connections do occur future implementation of conservation programs can help alleviate system-wide demand pressures.
Source: Fruitridge Vista Water Company, July 2010.

Groundwater is assumed to be drought resistant and reliable under all hydrologic conditions therefore no changes in supply are anticipated.

For each of the five-year increments presented above, the multiple-year dry period indicates that ample supplies will be available to meet demands. Although a decrease in availability of groundwater could occur during a multiple dry year, groundwater is assumed to be drought tolerant; therefore, supply from groundwater is unchanged under dry year conditions. If groundwater supplies were reduced due to dry year conditions, auxiliary supplies from the City of Sacramento[22] would be used to balance any service area shortfalls to meet customer demands. In addition, implementation of demand management (conservation) programs could

22 The City of Sacramento Agreement allocates 3.24 mgd or 3,630 AFA.

help to alleviate potential supply deficiencies and reduce system-wide demands prior to mandatory cutbacks.

SECTION 8 – ADOPTION AND IMPLEMENTATION OF UWMP

Water Code Section 10640

Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630).

The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article. 10641. An urban water supplier required to prepare a plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.

Water Code Section 10642.

Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code . The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

Water Code Section 10643.

An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.

Water Code Section 10644.

(a) An urban water supplier shall file with the department and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be filed with the department and any city or county within which the supplier provides water supplies within 30 days after adoption.

(b) The department shall prepare and submit to the Legislature, on or before December 31, in the years ending in six and one, a report summarizing the status of the plans adopted pursuant to this part. The report prepared by the department shall identify the outstanding elements of the individual plans. The department shall provide a copy of the report to each urban water supplier that has filed its plan with the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans submitted pursuant to this part.

Water Code Section 10645.

Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

FRUITRIDGE VISTA WATER COMPANY ADOPTION RESOLUTION

PUBLIC NOTIFICATION

FVWC encouraged the involvement of social, cultural and economic community groups during the preparation of the UWMP. Public notification was published in the local newspaper informing all community groups, including public and private water suppliers about the availability of the Draft UWMP. FVWC solicited comments and suggestions from those responsible parties.

The public notification contains the following language:

- Public Meeting and Plan Adoption Information
- Availability of the Urban Water Management Plan

As required by Water Code Section 10642, 10644, 10645 commencing on August 21, 2011 and continuing through September 22, 2011 a copy of this Draft UWMP was available for public review at the Fruitridge Vista Water Company office located at 1108 2nd Street, Suite 204, Sacramento, CA. No comments were received during the public review period. Any questions or comments regarding this UWMP should be directed to:

Beth Arnoldy
1108 2nd Street, Suite 204
Sacramento, CA, 95814
Office: (916) 443-2607
Email: barnoldy@fruitridgevista.com

Plan Adoption

The public was encouraged to attend a special public meeting held on Monday, October 10, 2011. Prior to close of this public meeting, a motion was made to adopt the UWMP; the motion was seconded and as appropriate General Manager Robert C. Cook, Jr. formally adopted this UWMP on Monday, December 5, 2011 at the Jose P. Rizal Community Center at 7320 Florin Mall Dr, Sacramento, CA. The Final UWMP will be submitted to DWR within 30 days of adoption. [Appendix B – Fruitridge Vista Water Company Resolution to Adopt the UWMP].

LIST OF APPENDICES

Engineering Report
In the Matter of the Permit Application
From the
Fruitridge Vista Water Company
Serving the residents of the Fruitridge Vista Area in Sacramento County
Water System No. 3410023
Sacramento County

State Department of Health Services
Drinking Water Field Operations Branch
December 2004

SUMMARY AND RECOMMENDATIONS

I. INTRODUCTION

1.1 Purpose of Report

The current permit was issued to the Fruitridge Vista Water Company (FVWC) on December 5, 1969. The FVWC submitted a permit application (dated June 25, 2004) to the Department to reflect the changes in the system since the issuance of the original permit in 1969. The purpose of this report is to document the sanitary engineering review of the water system and to make recommendations regarding the issuance of an updated domestic water supply permit.

1.2 Background Information

Water Supply Permit Summary

Date	Type	Number	Description
1953	Full	Unknown	Original permit to system.
12/5/69	Full	69-56	Updated full permit.
6/15/81	Amend.	None	Amendment to make specified changes to the system.

The original water supply permit for this system was granted in 1953. In 1969, the Department resurveyed and re-evaluated the system due to the changes that had occurred since 1953 and initiated a new permit action. Permit No. 69-56 is dated December 5, 1969. The 1969 permit listed 13 wells. A permit amendment

was issued on June 15, 1981 to make a number of system improvements including; upgrading the distribution system, adding manganese treatment at two wells, and installing some additional equipment at well sites but no additional wells were added to the operating permit at that time. However, none of the wells have any manganese treatment at this time.

1.3 Brief Description of System

List of Approved Domestic Sources for the FVWC

Name	Status	Station Code
Well 01	Active Raw	3410023-001
Well 02	Active Raw	3410023-002
Well 03	Active Raw	3410023-003
Well 04	Active Raw	3410023-004
Well 05	Active Raw	3410023-005
Well 06	Active Raw	3410023-006
Well 07	Active Raw	3410023-007
Well 08	Active Raw	3410023-008
Well 09	Active Raw	3410023-009
Well 10	Active Raw	3410023-010
Well 13	Active Raw	3410023-013
Well 14	Active Raw	3410023-014
Well 15-Standby	Standby Raw	3410023-015
Well 16	Active Raw	3410023-016
Well 17	Active Raw	3410023-017

Inactive Sources for the FVWC

Well 11-Inactive	Inactive Raw	3410023-011
Well 12-Inactive	Inactive Raw	3410023-012

The Fruitridge Vista Water Company is a privately owned water company with offices located at 1108 Second Street, Sacramento, California. The FVWC system consists of 17 wells, of which Wells Nos. 11 and 12 are inactive and disconnected from the system due to chemical contamination and Well No. 15 is designated as a standby well due to high iron and manganese levels. Well No. 2 is also offline as of the date of this report due to chemical contamination but is still listed as an active well for monitoring purposes. The chemical contamination is described in Section 2.1.1 (Groundwater Supplies)

The system does not have any storage other than a hydropneumatic tank at each of the well sites except for Wells Nos. 15 and 16.

The 2003 Annual Report to the DWP indicates the system serves a permanent population of approximately 15,000 people through 4797 general and residential service connections. The system does not have any commercial connections. Of the total connections, 4123 are flat rate, ~~673~~ 724 are metered and there is one flat

per PUC Report 2009

rate connection to Sacramento County Water Maintenance District, which is a very small adjacent water system. The FVWC is operated as a single pressure zone with typical system pressures ranging between 38 to 50 psi.

1.4 Enforcement History

A review of the Department's PICME database indicates that FVWC has not had any formal enforcement actions. There have been two past Public Notification requirements in response to total coliform exceedences in May 1992 and again in December 1992. The most recent Public Notification requirement was in June 2004 for a total coliform MCL exceedence.

1.5 Area Served

The Fruitridge Vista service area is located in an unincorporated area of approximately four square miles adjacent to the southern boundary of the City of Sacramento in Sacramento County (see Appendix B). The area is mostly residential with some commercial and light industrial businesses.

1.6 Production Data

Total Number of service connections:	4,797
Number of metered service connections:	673
Approximate Population served:	15,000
Water produced during 2003:	1,689 MG
Maximum monthly production (July):	268 MG (6004 gpm)
Maximum daily production:	No figures available

Summary of Water Usage in the System

Year	Service Conn.	Total Annual Production (MG)	Maximum Month Usage (MG)	Max Day Usage (MG)
2003	4797	1689	268	No figures available

The 2003 Annual Report indicated the system produced a total of 1,689 MG for 2003 and 268 MG during the peak month of July. Maximum day production figures were not available. An analysis of the adequacy of supply is included in Section 2.1.3 of this report.

1.7 Facilities

There are no proposed facilities being addressed in this permit action. All wells in the FVWC system are existing wells, with the most recent well (No. 17) having been drilled in early 2000. Wells Nos. 14, 15, 16, and 17 have not been permitted previously and therefore, are being addressed in this permit action.

1.8 Sources of Information

Information for this report was obtained from discussions with FVWC personnel, files of the Department of Health Services, Drinking Water Field Operations Branch, Sacramento District Office, and from field reviews of the water system and distribution facilities. The most recent Annual Inspection of the system was conducted on June 17, 2004. The permit application is included in Appendix A.

II. INVESTIGATION AND FINDINGS

2.1 Sources of Supply

2.1.1 Groundwater Supplies

Summary of Groundwater Sources for Fruitridge Vista Water Co.

Well No.	Primary Station Code	Status in PICME	Cap. GPM	HP	Lube Type	Gen	Location
1	3410023-001	Active	450	40	Oil		4712 Iowa Ave.
2 Offline	3410023-002	Active	450	40	Oil		4718 37th Ave.
3	3410023-003	Active	600	50	Water		5861 44th St.
4	3410023-004	Active	450	30	Water		5659 44th St.
5	3410023-005	Active	600	40	Water		5800 40th St.
6	3410023-006	Active	285	20	Oil		4560 Soledad Ave.
7	3410023-007	Active	700	50	Oil		6211 Leola Way
8	3410023-008	Active	385	20	Water		6833 Chevy Chase Way
9	3410023-009	Active	895	60	Oil		6604 Wire Dr.
10	3410023-010	Active	760	50	Water		6807 47th St.
11 Inactive	3410023-011	Inactive	(830)	50	Oil	Y	3792 47th St.
12 Inactive	3410023-012	Inactive	(660)	50	Oil		5950 Dewey Blvd.
13	3410023-013	Active	1130	100	Oil		7100 Franklin Blvd.
14	3410023-014	Active	873	60	Water	Y	4129 Apostolo Cir.
15 Standby	3410023-015	Standby	(650)	75	Oil		5351 47th Ave
16	3410023-016	Active	650	100	Water	Y	Vernace Way & Frawley WY (NW Cr.)
17	3410023-017	Active	550	60	Water	Y	6629 46th Street
		Total Active Capacity	**8778**				

GEN: Generator for alternative power supply

Well No. 1: This well was drilled in 1948 by the cable tool method and records indicate that the well has only a three-foot annular seal and is located within 25 feet of an old 6-inch VCP sanitary sewer. The well is not gravel packed. The well was reportedly cased with 102 feet of 10-inch diameter steel casing and the total depth of the borehole was reported to be 321 feet.

FVWC conducted a television survey in July 1991, which revealed that the 10-inch casing went to a depth of 104 feet and the bottom of the well at that time was 258 feet. The distance to highest perforations is reported to be 87 feet. The well discharges to a 2,500-gallon hydropneumatic tank.

Due to extensive detections of Tetrachloroethylene (PCE) at concentrations at or above one half of the MCL, quarterly VOC monitoring shall be continued.

Well No. 2: This well was drilled in 1948 by the cable tool method and records indicate that the well has only a three-foot annular seal and is located within about 45 feet of a sanitary sewer. The well is not gravel packed. The well was cased with 138 feet of 10-inch diameter steel casing and the total depth of the borehole was reported to be 224 feet. The distance to highest perforations is reported to be 115 feet. The well discharges to a 2,500-gallon hydropneumatic tank.

At the time of this report, Well No. 2 was offline due to detections of MTBE and PCE at concentrations above their MCLs and TCE at concentrations up to about one half of the MCL. Additionally, monitoring conducted in March 2004 had detections of iron (2,300 ug/l), manganese (70 ug/l), and aluminum (1,300 ug/l), which are all above the respective MCLs. Well No. 2 is still listed as an active well and therefore, quarterly monitoring must be conducted.

Well No. 3: This well was drilled in 1951 by the cable tool method and records indicate that the well has only a six-foot annular seal and is located within about 42 feet of a sanitary sewer. The well is not gravel packed. The well was reportedly cased with 114 feet of 14-inch diameter steel casing and the total depth of the borehole was reported to be 315 feet.

FVWC conducted a television survey in November 1997, which revealed that the 14-inch casing actually went to a depth of 102 feet and there the casing reduced to 12 inches in diameter and continued to a depth of 190 feet. After completion of the video inspection, the 14-inch casing was wire brushed to remove heavy incrustation and perforated. A 12-inch diameter casing was then inserted to a depth of 103 feet and swaged at the bottom to the existing 12-inch casing. The annular space between the new 12-inch and existing 14-inch casing was pumped full of neat cement in an effort to force the cement out of the 14-inch casing through the perforations to create a cement seal with the bore hole. The distance to highest perforations on the 12-inch casing is reported to be 134 feet.

The original deep well turbine pump has been replaced with a submersible pump. The well discharges to a 2,500-gallon hydropneumatic tank.

Well No. 3 has Nitrate concentrations that typically range between 31 and 35 mg/l and is on a quarterly Nitrate monitoring schedule.

Well No. 4: This well was drilled in 1952 by the cable tool method and records indicate that the well has only a six-foot annular seal and is located within about 49 feet of a sanitary sewer. The well is not gravel packed. The well was reportedly cased with 128 feet of 14-inch diameter steel casing and the total depth of the borehole was reported to be 270 feet. The distance to highest perforations is not known. The well discharges to a 5,000-gallon hydropneumatic tank.

Due to a history of detections of Trichloroethylene (TCE) at concentrations that have not exceeded 1.5 ug/l (MCL=5.0 ug/l), monitoring may be reduced from quarterly to annual.

Well No. 5: This well was drilled in 1954 by the cable tool method and records indicate that the well has a 72-foot annular seal and is located within about 55 feet of a sanitary sewer. The well is not gravel packed. The well was reportedly cased with 180 feet of 14-inch diameter steel casing and the total depth of the borehole was reported to be 320 feet. The distance to highest perforations is reported to be 150 feet. The well discharges to a 5,000-gallon hydropneumatic tank.

Well No. 6: Information on file for Well No. 6 is incomplete. A television survey was conducted in May 1999 that revealed a 10-inch diameter casing extends to a depth of 126 feet. Other subsurface construction features are not known. The well is reportedly about 150 feet from the nearest sanitary sewer. The well discharges to a 2,500-gallon hydropneumatic tank.

Well No. 7: This well was drilled in 1956 by the cable tool method and records indicate that the well has a 60-foot annular seal and is located within about 55 feet of a sanitary sewer. The well is not gravel packed. The well was reportedly cased with 278 feet of 14-inch diameter steel casing and the total depth of the borehole was reported to be 300 feet. The distance to highest perforations is reported to be 162 feet. The well discharges to a 5,000-gallon hydropneumatic tank.

Well No. 7 has Nitrate concentrations that typically range between 25 and 31 mg/l and is on a quarterly Nitrate monitoring schedule.

Well No. 8: This well was drilled in 1953 by the cable tool method and records indicate that the well has a 36-foot annular seal and is located within about 105 feet of a sanitary sewer. The well is not gravel packed. The well was reportedly cased with 294 feet of 14-inch diameter steel casing and the total depth of the borehole was reported to be 387 feet. The distance to highest perforations is reported to be 138 feet. The well discharges to a 5,000-gallon hydropneumatic tank.

Well No. 9: This well was drilled in 1958 by the cable tool method and records indicate that the well has a 56-foot annular seal and is located within about 120 feet of a sanitary sewer. The well is not gravel packed. The well was reportedly cased with 272 feet of 14-inch diameter steel casing and the total depth of the borehole was reported to be 408 feet in the 1969 permit. The distance to highest perforations is reported to be 218 feet. The well discharges to a 5,000-gallon hydropneumatic tank.

FVWC conducted a television survey in February 1994, which revealed that the 14-inch diameter casing existed to a depth of 267 feet. The survey revealed mill slot type perforations from 220 to 225 feet and from 249 to 267 feet and a hole and a casing separation in the 14-inch diameter casing was also noted during the survey. After completion of the survey, the 14-inch casing was perforated from 68 feet to 120 feet, a 12-inch diameter liner was installed to a depth of approximately 200 feet and the annular space between the 12 and 14-inch casings was pressure grouted from 200 feet to the ground surface. At the completion of the rehabilitation work in 1994, the well's total depth was measured at 267 feet.

Well No. 10: This well was drilled in 1960 by the cable tool method and records from FVWC indicate that the well has a 108-foot annular seal and is located approximately 92 feet from a sanitary sewer. The well is not gravel packed. The well was reportedly cased with 205 feet of 14-inch diameter steel casing, which reduces to a 12-inch diameter casing from 205 to 315 feet. The total depth of the borehole was reported to be 352 feet in the 1969 permit. Perforations are reportedly located from 143 feet to 148 feet and from 290 feet to 294 feet. The well discharges to a 5,000-gallon hydropneumatic tank.

Well No. 11: This well is currently inactive and disconnected from the distribution system due to MTBE contamination that has been as high as 26 ug/l. Additionally Well No. 11 has iron and manganese that are both above the MCLs. Nitrate concentrations typically range between 25 to 29 mg/l.

Well No. 11 was drilled in 1962 by the cable tool method and records from FVWC indicate that the well has a 70-foot annular seal. The well is not gravel packed. The well was reportedly cased with 270 feet of 14-inch diameter steel casing and has a total bore depth of 452 feet. The distance to highest

perforations is reported to be 113 feet. The well discharges to a 5,000-gallon hydropneumatic tank.

Well No. 12: This well is currently inactive due to PCE contamination that has been as high as 22 ug/l and also TCE contamination, which has not been above 1.0 ug/l. Additionally Well No. 12 has iron and manganese that are both above the MCLs. Nitrate concentrations typically range between 25 to 27 mg/l but have gone as high as 34 mg/l.

Well No. 12 was drilled in 1964 by the cable tool method and records from FVWC indicate that the well has a 100-foot annular seal. The well is not gravel packed. The well was reportedly cased with 270 feet of 14-inch diameter steel casing and has a total bore depth of 292 feet. Perforations are reportedly located from 170 feet to 178 feet and from 218 feet to 222 feet. The well discharges to a 5,000-gallon hydropneumatic tank.

Well No. 13: This well was drilled in 1966 by the reverse rotary method and records indicate that the well has a 50-foot annular seal and is gravel packed. The well was reportedly cased with 405 feet of 14-inch diameter steel casing and has a total bore depth of 430 feet. Perforations are reportedly located from 120 feet to 180 feet, from 210 feet to 282 feet, and from 364 feet to 400 feet. The well discharges to a 5,000-gallon hydropneumatic tank.

Well No. 14: This well was drilled in 1975 by the rotary method and records indicate that the well has a 46-foot annular seal and is gravel packed. The well was reportedly cased with 336 feet of 14-inch diameter steel casing but the total bore depth is not known. Perforations are reportedly located from 158 feet to 332 feet. The well discharges to a 5,000-gallon hydropneumatic tank.

Well No. 15: This well is a standby well that has been maintained for fire suppression and has been pumped to waste for sampling only and has not been pumped into the distribution system. This well exceeds MCLs for iron and manganese. Iron concentrations have ranged from 520 ug/l to 1,400 ug/l in recent years and manganese concentrations have ranged from a low of 470 ug/l to as high as 790 ug/l.

Well No. 15 was drilled in 1985 by both cable tool and rotary methods and records indicate that the well has a 50-foot annular seal and is not gravel packed. The well was reportedly cased with 278.5 feet of 14-inch diameter steel casing using the cable tool method. The 14-inch casing reportedly broke at a depth of 152 feet and consequently, 338 feet of 12-inch diameter casing was installed to mitigate the problem. After the installation of the 12-inch diameter casing, 8-inch diameter casing was installed to a depth of 600 feet utilizing the rotary drilling method. The well is reportedly perforated from 340 feet to 360 feet, 400 feet to 420 feet, 440 feet to 480 feet, and from 540 feet to 580 feet.

Well No. 16: This well was drilled in 1999 by the reverse rotary method and records indicate that the well has a 180-foot annular seal and is gravel packed. The well was reportedly cased with 300 feet of 16-inch diameter steel casing, which is perforated from 225 to 290 feet. Well No. 16 is equipped with a variable frequency drive and chlorination is achieved by means of a US Filter hypochlorite generator. All other system wells have direct sodium hypochlorite injection. The well discharges to the distribution system.

Well No. 17: This well was drilled in 2000 by the reverse rotary method and records indicate that the well has a 192-foot annular seal and is gravel packed. Total borehole depth is 415 feet. The well was reportedly cased with 278 feet of 16-inch diameter steel casing, which has perforations from 208 to 278 feet. The well discharges to a 5,000-gallon hydropneumatic tank.

2.1.2 Interconnections

The FVWC system has five inter-ties that are maintained closed and are for emergency use only. Four of the inter-ties are with the City of Sacramento and one is with Cal American. Manually controlled isolation valves control the inter-ties.

2.1.3 Adequacy of Supply

Adequacy of Supply

According to the California Water Works Standards, a system of this size without storage and mostly flat rate services (approx. 14% are metered) should have a source capacity of about 11,000 gpm. The available capacity from the 14 active wells is about 8778 gpm. Based on reported total annual production of 1,689 MG during 2003, the average daily demand is about 3200 gpm.

The maximum month of July used 268 MG or an average of about 6000 gpm. Maximum day figures were not reported. In order to estimate maximum day demand, a factor based on similar water systems can be used. In the Sacramento area, a maximum day use factor of 1.67 to that of average day use would result in an estimated maximum day demand of about 5344 gpm. However this would be less than the maximum month average of 6000 gpm.

Based on figures presented in the December 1997 Annual Inspection by the Department, it was estimated that the peak hour to average day demand was about 3. This figure was determined from data from other similar water system in the Sacramento area, which determine daily water use. Using this figure, the peak hour demand would be roughly 9600 gpm. This equates to a pumping deficiency of about 800 gpm during hours of peak demand, assuming all 14 active wells are in service. Since each active well does have a 2,500 or 5,000-

gallon pressure tank, this may be sufficient to bridge short-term capacity deficiencies during peak demands periods.

Estimated Concurrent Maximum Day Demand and Fire Flow

Based on population only, the required fire flow can be estimated by using the following formula recommended by the American Insurance Association:

$$Q = 1020P^{1/2}(1-0.01P^{1/2})$$

Where Q is the flow required in gallons per minute, and P is the population in thousands of people (approx. 15,000) served by the system. According to this equation, the fire flow requirement in the system would be about 3800 gpm. This is a very general assumption based on population only, that does not take into account any other factors, which can affect the required fire flows.

The coincident draft (flow to be expected at the time the fire is being fought) during fire fighting is usually considered to be equal to the maximum daily demand (6000 gpm based on maximum month) since the probability of the maximum rate (peak hourly demand) of water usage for community purposes occurring simultaneously with a major fire is slight. Based on the above-stated assumptions, estimated total fire flow and maximum daily demand could approach approximately 9800 gpm.

The current total active groundwater source capacity is approximately 8778 gpm. Based on the actual 2003 system usage and the estimated required fire flows, it appears that the system may have inadequate source capacity to meet the combined maximum daily demand (based average over maximum month) and estimated fire flows, even with all 14 active wells in operation. With less than 14 wells in operation, the problem of meeting demands would be greatly increased.

Based on the preceding analysis, the pumping capacity should be quite adequate to meet the routine demands, provided all currently active wells are in service. However, the current system capacity to meet estimated peak demands or a combined maximum day/fire flow situation appears to be deficient or marginal at best. This analysis does not consider the emergency interconnections with the City of Sacramento and Cal American, which are available in an emergency situation.

Operation During a Power Outage

Active Wells Nos. 14, 16, and 17 have emergency generators and a combined capacity of about 2075 gpm, which may be able to meet short-term demands during very low-use periods such as late night. However, a widespread power

outage can occur at any time and there is clearly not sufficient capacity with emergency power backup to meet typical demands.

FVWC is aware of the overall capacity deficiency and the lack of adequate emergency power backup in their system. Subsequent to the 1997 Annual Inspection, the Department requested FVWC develop a plan and timetable to address this issue but it is uncertain if such a plan was ever developed. It was reported that the issue was addressed to some degree in the Master Plan 2000, however, this has not been verified.

The 2003 FVWC Consumer Confidence Report contains information on Emergency Water Conservation Rules, which are effective July 1 through October 15. The Rules specify even and odd watering days depending on the street address number and discusses other water conservation measures, which will help with general capacity shortfall.

2.2 Treatment

2.2.1 Groundwater

FVWC does not treat any of its water sources, with the exception of chlorination of all sources with sodium hypochlorite. A permit amendment dated June 15, 1981 referenced manganese treatment at Wells Nos. 5 and 13 and gas chlorinators at all wells. However, during the June 2004 inspection, the Operations Manager stated that FVWC does not treat at any of the wells at this time and disinfection is now accomplished with sodium hypochlorite (Bacticide 12.5%) at all wells.

All chemicals or products (additives) added to drinking water as part of the treatment process are required to be certified as meeting the specifications of American National Standards Institute (ANSI)/National Sanitation foundation (NSF) Standard 60. The additives should be NSF or Underwriters laboratory (UL) approved for potable water usage. The following additive is a NSF Standard 60 Drinking water treatment chemical.

Summary of Drinking Water Additives

Additive	Manufacturer/ Product ID	Purpose	Point of Application
Sodium Hypochlorite	Bacticide (12.5%)	Disinfection	At each well.

2.3 Storage

Storage for the FVWC consists of 2,500 and 5,000-gallon hydropneumatic tanks located all well sites except for Wells Nos. 15 and 16.

2.4 Distribution System and Classification

The FVWC distribution system has been evaluated and classified as a D3 distribution system.

2.4.1 Distribution Mains

The FVWC has detailed and up-to-date distribution system maps to assist in any maintenance requirements of the system. System repairs and maintenance are conducted in accordance with AWWA standards. Improvements to the system are consistent with the State Water Works Standards.

2.4.2 Pressure Zones

The FVWC water system is operated as a single pressure zone. Typical pressures in the system generally range from 38 psi to 50 psi.

2.5 Operation and Maintenance

2.5.1 Organization and Personnel

Management and operations of the FVWC are carried out by Robert C. Cook, General Manager and Steven Cook, Operations Manager. Steven Cook is a T2 Water Treatment Operator and a D3 Distribution Operator. Greg Folena, Field Services Personnel, is also a T2 Water Treatment Operator and a D3 Distribution Operator. The FVWC system's certified distribution operators are listed in the following table:

Certified Personnel

Name	Title	Grade
Stephen Cook	Operations Manager	T2, D3
Greg Folena	Field Services Personnel	T2, D3

2.5.2 Cross Connection Program

The District has an enforceable Cross-Connection Control Program that incorporates all elements required under Title 17 of the CCR.

Backflow Prevention Assemblies

	Total No. in System	No. Installed in 2003	No. Tested in 2003	No. Failed in 2003	No. Repaired/ Replaced
Backflow Prevention	160	9	123	15	3

Assemblies on Service Connections at the Meter					
Backflow Devices On-site in lieu of at the Meter					
Air-gaps					

Steven Cook is the designated Cross Connection Control Program Coordinator and is a trained Backflow Prevention Assembly General Tester (Cert. No. 3379). According to the 2003 Annual Report, the last cross-connection control survey was done in December 2003.

In accordance with 17CCR Section 7605(c), Backflow preventers shall be tested at least annually or more frequently if determined to be necessary by the health agency or water supplier. According to the 2003 Annual Report, not all of the 160 devices in the system were tested during 2003. The backflow device-testing program is administered by the Sacramento County Environmental Health Department. Each year, letters are sent to customers notifying them that testing is required. A list of certified testers is also provided. FVWC is following up with the County to determine whether all devices that were not tested or failed initial testing in 2003 have now been tested and passed.

2.5.3 Complaint Program

Any water service or water quality complaints received from customers are recorded and filed at the FVWC office. The most recent (2003) Annual Report to the Drinking Water Program listed the following problems and complaints:

Type of Problem	No. of Problems	No. of Problems Investigated	No. of Problems Reported to DHS
Service Connection Breaks/ Leaks	99	99	0
Main Breaks/Leaks	23	23	0
Water Outages	0		
Boil Water Orders	0		
Taste and Odor	13	13	0
Color	4	4	0
Turbidity	7	7	0
Pressure	38	38	0
Illnesses (Waterborne)	0		
Other (Specify)	63		0

The "other" complaints were mainly wasted water calls. All complaint and problems are checked and corrections/repairs made when necessary.

2.5.4 Maps & Plans and Disaster Response Plan

A current distribution map showing the water main sizes, valving, etc., is maintained by the FVWC and a copy was noted at the Corporation Yard during the Annual Inspection.

FVWC must submit an Emergency Response Plan (ERP) within six months of completing a Vulnerability Assessment. The ERP is currently being developed and is required to be submitted to the Department by December 31, 2004.

2.5.5 Consumer Confidence Report

The most recent (2003) Consumer Confidence Report was sent to customers on July 1, 2004.

2.5.6 Emergency Notification Plan

A Water Quality Emergency Notification Plan (ENP) for the FVWC was last updated on June 15, 2004 and was submitted during the inspection. This plan lists personnel to be contacted in an emergency and lists procedures to be used by FVWC to notify customers in the event of a water quality emergency. The ENP is current and does not need modifications.

2.5.7 Operation Controls

The FVWC well operation is determined by pressure in the system. The FVWC does not currently have any SCADA system in place to enable remote monitoring of the system.

2.5.8 Flushing Program

	Total No. In System	No. with Blowoffs	No. Flushed in 2003	Frequency of Flushing
Dead end	30	30	30	Monthly

2.5.9 Valve Maintenance Program

The purpose of a valve maintenance program is to determine the location of all valves and uncover those that are buried or paved over, to record the location of the valves in a permanent record keeping system, to determine that each valve has a valve box with a cover, to clean dirt out of the valve box so that the valve nut is easily accessible for operation of the valve, to exercise the valve to ensure it is operable and not broken, and to verify that the valve is in fully open position.

	Size Range	Total No. in System	No. Exercised in 2003	Frequency of Exercising
Valves	2"-13"	500	500	Annually

2.5.10 Main Disinfection Program

Typically, repaired mains are disinfected using calcium hypochlorite tablets. Repairs are performed by FVWC field personnel.

2.6 Water Quality Monitoring

2.6.1 Raw Wellhead Bacteriological Monitoring

Systems that chlorinate are required to conduct raw wellhead bacteriological monitoring either monthly or quarterly. Due to the FVWC's history of sporadic coliform problems with some wells, the following coliform testing protocol is to be used subsequent to any total coliform positive well samples.

After disinfection of the well, flushing, and sampling, the well would be placed back into service once three consecutive negative (10-tube) total coliform samples were confirmed. The Department would then be contacted, informed of the testing results and a request would be made to put the well back online. Once back online, the well would be tested on a weekly basis for two months, biweekly for the next four months, and with no positive coliform results during that period, returned to a monthly testing schedule.

After the June 2004 Annual Inspection, FVWC was directed to develop a written policy to be provided to all water system field personnel that may be involved in well disinfection, sampling, etc. FVWC was advised to include a standardized table to be used to record the dates and results of weekly, biweekly, and monthly coliform testing for wells that have had to be disinfected due to bacteriological contamination. The goal of this directive was to ensure that well coliform sampling is accurately tracked and recorded. A copy of the table shall be sent to the Department upon completion of the weekly and biweekly monitoring of previously disinfected wells as confirmation of the completion of the weekly/biweekly testing and the return to routine monthly testing.

Wells Nos. 1, 2, 3, 4, 6, 8, 10, and 14 shall be monitored routinely on a monthly basis for coliform and the other active system wells shall be monitored at least once every two months. If coliform is detected, the sampling protocol described above is to be followed.

Additionally, if any of the system wells have been idle for a period of one week or longer, coliform samples shall be taken at initial startup of that well and one hour after continuous operation. If a presence/absence test is used and the result is positive for total coliform, the FVWC shall conduct repeat monitoring within 24 hours using an approved method that provides enumeration of the results. FVWC shall contact the Department's Sacramento District office in the event of

any positive coliform results from any of the system's wells. The table below shows the status of the wells as of the date of this report and the monitoring frequency to be used for each well.

Fruitridge Vista Well Coliform Monitoring Schedule

Well No.	History/Comments	Monitoring Frequency
Well 1	Shallow seal (3 ft)	Monthly
Well 2	Shallow seal (3 ft)	Currently offline due to chemical contamination.
Well 3	Original shallow seal (6 ft) Well rehabilitated to try to seal between 14-inch casing and borehole.	Monthly
Well 4	Shallow seal (6 ft)	Monthly
Well 5		Every two months.
Well 6	**Shallow seal and recent TC+ sample**	**After disinfection, flushing and 3 negative samples, initiate weekly sampling for 2 months, biweekly for 4 months.**
Well 7		Every two months.
Well 8	**Shallow seal (36 ft)**	**Currently on weekly monitoring. After 2 months, biweekly for 4 months, then monthly.**
Well 9		Every two months.
Well 10	Suspected shallow seal	Monthly
Well 11	Inactive and offline due to chemical contamination.	
Well 12	Inactive and offline due to chemical contamination.	
Well 13		Every two months.
Well 14	**Shallow seal (46 ft)**	**Currently on biweekly. After 4 months, then monthly.**
Well 15		Every two months.
Well 16		Every two months.
Well 17		Every two months.

2.6.2 Chemical Monitoring

The first table below summarizes the last monitoring conducted on the wells and the second table summarizes the monitoring that is now due for the wells. Immediately following the tables are legends that define the abbreviations used in the tables.

Table 1 Summary of Last Monitoring (Fruitridge Vista)

Well	Inorg.	Nit	GM/GP	VOCs	SOCs	N.Rad. (Last Qtr)
Freq	3 Yr	1 Yr	3 Yrs	3 Yrs	3 Yrs	4Q/4Y
1	1/03	3/04	3/04	3/04	3/02 6/02	1/03, 4/03 7/03, 10/03
2	1/03	3/04	3/04	3/04	3/02 6/02	1/03, 4/03 7/03, 10/03
3	1/03	5/04	3/04	3/04	3/02 6/02	1/03, 4/03 7/03, 10/03
4	1/03	3/04	3/04	3/04	3/02 6/02	1/03, 4/03 7/03, 10/03
5	1/03	3/04	3/04	3/04	3/02 6/02	1/03, 4/03 7/03, 10/03
6	1/03	3/04	3/04	3/04	3/02 6/02	1/03, 4/03 7/03, 10/03
7	1/03	5/04	3/04	3/04	3/02 6/02	1/03, 4/03 7/03, 10/03
8	1/03	5/04	5/04	1/03	3/02 6/02	1/03, 4/03 7/03, 10/03
9	1/03	3/04	3/04	3/04	3/02 6/02	1/03, 4/03 7/03, 10/03
10	1/03	5/04	5/04	7/03	3/02 6/02	1/03, 4/03 7/03, 10/03
13	1/03	3/04	3/04	3/04	3/02 6/02	1/03, 4/03 7/03, 10/03
14	1/03	5/04	5/04	7/03	3/02 6/02	1/03, 4/03 7/03, 10/03
15 Standby	1/03	3/04	3/04	3/04	3/02 6/02	1/03, 4/03 7/03, 10/03
16	6/02	3/04	1/03	3/04	3/02 6/02	1/03, 4/03 7/03, 10/03
17	6/02	3/04	1/03	3/04	3/02 6/02	1/03, 4/03 7/03, 10/03

Inorg.=Inorganics – 64431-A (Aluminum, Arsenic, Barium, Cadmium, Chromium, Mercury, Selenium, Fluoride, Asbestos, Antimony, Beryllium, Cyanide, Nickel, Thallium, Nitrite)
Nit=NITRATE: Annual nitrate monitoring is required.
GM/GP=General Mineral/General Physical and Secondary Standards, TABLE 64449-A & B
VOCs=Volatile Organic Chemicals - Table 64444-A SOCs=Synthetic Organic Chemicals - Table 64444-A
N. Rad=NATURAL RADIOACTIVITY - Sec 64441

The following table summarizes the monitoring that is next due or past due. Dates indicate the next monitoring that is to be conducted for that category. Under the Nit (nitrate) category, **>1/2 MCL Quarterly** means that the nitrate level is greater than one half of the MCL and requires quarterly monitoring.

Table 2: Summary of Next Required Monitoring (Fruitridge Vista)

Well	Inorg.	Nit	GM/GP	VOCs	SOCs	N.Rad.
Freq	3 Yr	1 Yr	3 Yrs	3 Yrs	3 Yrs	1 sample
1	1/06	3/05	3/07	Quarterly	3/05 & 6/05	Jan. 2009
2 Offline	1/06	3/05	3/07	Quarterly	3/05 & 6/05	Jan. 2009
3	1/06	>1/2 MCL Quarterly	3/07	3/07	3/05 & 6/05	Jan. 2006
4	1/06	3/05	3/07	Annually each March	3/05 & 6/05	Jan. 2009
5	1/06	3/05	3/07	3/07	3/05 & 6/05	Jan. 2009
6	1/06	3/05	3/07	3/07	3/05 & 6/05	Jan. 2012
7	1/06	>1/2 MCL Quarterly	3/07	3/07	3/05 & 6/05	Jan. 2009
8	1/06	3/05	3/07	1/06	3/05 & 6/05	Jan. 2012
9	1/06	3/05	3/07	3/07	3/05 & 6/05	Jan. 2012
10	1/06	3/05	3/07	7/06	3/05 & 6/05	Jan. 2012
13	1/06	3/05	3/07	3/07	3/05 & 6/05	Jan. 2012
14	1/06	3/05	3/07	7/06	3/05 & 6/05	Jan. 2012
15 Standby	1/12	3/13	3/13	3/2013	~~3/05 & 6/05~~	~~Jan. 2012~~
16	6/05	3/05	1/06	3/07	3/05 & 6/05	Jan. 2012
17	6/05	3/05	1/06	3/07	3/05 & 6/05	Jan. 2012

let 3 yrs in 2013 per D. Zeman

2.6.2.1 Inorganic Chemicals

Routine monitoring is required every three years for active wells.

All of the wells except for Wells Nos. 16 and 17 were monitored for Inorganics in January 2003. Wells Nos. 16 and 17 were monitored in June 2002.

Note: The Federal Arsenic Rule went into effect on February 22, 2002 and compliance with the new MCL of 10 ug/l is required by January 23, 2006. The Department will adopt regulations for the new arsenic MCL within the next two years. It is anticipated that the compliance date for the State MCL will also be January 23, 2006. Compliance with the new MCL will be based on the running average of the monitoring results for four consecutive quarters. Single

monitoring results for the wells listed in the following table indicate arsenic concentrations are below the new MCL for all wells except Well No. 6.

FVWC Arsenic Concentrations

Well No.	Arsenic Concentration (Most Recent Sampling)
1	2.0 ug/l (1/03)
2	ND (1/03)
3	2.0 ug/l (1/03)
4	3.0 ug/l (1/03)
5	4.0 ug/l (1/03)
6	**11.0 ug/l (1/03)**
7	3.0 ug/l (1/03)
8	4.0 ug/l (1/03)
9	3.0 ug/l (1/03)
10	3.0 ug/l (1/03)
13	4.0 ug/l (1/03)
14	4.0 ug/l (1/03)
15	6.0 ug/l (1/03)
16	4.0 ug/l (6/02)
17	5.0 ug/l (6/02)

2.6.2.2 Nitrates/Nitrites

Groundwater wells in the Sacramento, San Joaquin Valley areas are vulnerable to high nitrate contamination and all active wells are required to be monitored annually. Wells with nitrate concentrations in excess of 50 percent of the MCL (MCL=45 mg/l) are required to be monitored quarterly. If quarterly monitoring indicates that there is no upward trend to the nitrate concentration, the well may be placed on annual monitoring.

Nitrite (as Nitrogen) and Nitrate + Nitrite are required to be monitored every three years.

Nitrate Monitoring for Fruitridge Vista

Well	Concentration (Most Recent Monitoring)	Monitoring Interval	Next Monitoring Due
1	20.0 mg/l (3/04)	**Annually**	3/05
2	24.0 mg/l (3/04)	**Annually** (No upward trend)	3/05
3	31.0 mg/l (5/04)	Quarterly	**8/04, 11/04, 2/05**
4	19.0 mg/l (3/04)	**Annually** (No upward trend)	3/05
5	25.0 mg/l (3/04)	**Annually** (No upward trend)	3/05
6	23.0 mg/l (3/04)	**Annually** (No upward trend)	3/05
7	19.0 mg/l (5/04)	Quarterly	**8/04, 11/04, 2/05**
8	7.0 mg/l (5/04)	**Annually**	3/05
9	4.0 mg/l (3/04)	**Annually**	3/05
10	17.0 mg/l (5/04)	**Annually**	3/05
11 Inactive		**NA**	Inactive well
12 Inactive		**NA**	Inactive well
13	10.0 mg/l (3/04)	**Annually**	3/05
14	26.0 mg/l (5/04)	**Annually**	3/05
15 Standby	ND (3/04)	**Once every 9 years**	Standby well 3/2013
16	4.0 mg/l (3/04)	**Annually**	3/05
17	6.0 mg/l (3/04)	**Annually**	3/05

2.6.2.3 General Minerals and Physicals

Monitoring for these constituents is required every three years for active wells.

As can be seen from Table 1 above, most of the wells had General Mineral/General Physical monitoring conducted in March 2004, with Wells Nos. 16 and 17 having been done in January 2003. Wells Nos. 8, 10, and 14 were last monitored in May 2004.

Well No. 15 is a Standby well and was last monitored for General Mineral/General Physical chemicals in March 2004.

2.6.2.4 Volatile Organic Chemicals (VOCs)

VOC monitoring is required every 3 years for existing wells and for 4 quarters for new wells.

All wells have had VOC monitoring conducted over several quarters in the last 16 months. The table below shows the most recent monitoring date and the number of quarters since January 2003.

Fruitridge Vista VOC Monitoring

Well	Most Recent Monitoring	Number of Quarters Conducted Since Jan 03	Comments	Next Monitoring Due
1	3/04	5	PCE detections - Quarterly VOC monitoring.	Quarterly (Spaced 3 months apart)
2	3/04	5	Still listed as active but offline due to MTBE, PCE, TCE.	Quarterly (Spaced 3 months apart)
3	3/04	3	All ND	3/07-one time
4	3/04	5	TCE detections -Annual VOC monitoring.	Annually in March 3/05, 3/06, etc. (Represents Highest Quarter)
5	3/04	2	All ND	3/07-one time
6	3/04	3	All ND	3/07-one time
7	3/04	3	All ND	3/07-one time
8	1/03	1	All ND	1/06-one time
9	3/04	3	All ND	3/07-one time
10	7/03	2	All ND	7/06-one time
13	3/04	3	All ND	3/07-one time
14	7/03	2	All ND	7/06-one time
15	3/04	5	Standby Well-All ND	3/2013-one time
16	3/04	2	All ND	3/07-one time
17	3/04	3	All ND	3/07-one time

Special Monitoring

Well No. 1: Due to detections of Tetrachloroethylene (PCE) at concentrations at or above one half of the MCL, quarterly monitoring shall be continued.

Well No. 2: This well is currently offline due to detections of MTBE, PCE, and TCE. Since well is listed as active, quarterly monitoring shall be continued.

Well No. 4: Due to detections of Trichloroethylene (TCE) at concentrations that have not exceeded 1.0 ug/l (MCL=5.0 ug/l), monitoring may be reduced from quarterly to annual.

Inactive Wells

Well No. 11: This well is inactive due to MTBE contamination that has been as high as 26 ug/l. Additionally Well No. 11 has iron and manganese that are both above the MCLs.

Well No. 12: This well is inactive due to PCE contamination that has been as high as 20 ug/l and also TCE contamination below the MCL. Additionally Well No. 12 has iron and manganese that are both above the MCLs.

2.6.2.5 Synthetic Organic Chemicals (SOCs)

Note: A new 9-year compliance cycle began on January 1, 2002. All water systems will be required to monitor for all of the chemicals listed in Table 64444-A(b). The requirement for SOC monitoring of ground water sources shall consist of four (4) quarterly samples collected 3 months apart within a year or two samples during the periods of greatest vulnerability unless waivers for specific SOCs are requested and granted in accordance with Section 64445(d) of Title 22, California Code of Regulations.

For existing, previously monitored wells, routine monitoring is required every three years during two consecutive quarters.

The Fruitridge Vista Water Company conducted monitoring in March and June 2002 for the regulated SOCs for all wells and there were no detections. The next SOC monitoring shall be conducted in the first and second quarters of 2005.

2.6.2.6 Unregulated Chemicals (UCMR) – Table 64450

No MCL's are currently available for these chemicals. Regulations effective January 3, 2001, require monitoring for the listed chemicals unless waivers are applied for and granted in accordance with Title 22, Section 64450(d)(1) and (2). No waivers will be granted for Boron, Vanadium, and Chromium VI.

The following table shows the detections of Chromium VI and Vanadium for the Fruitridge Vista system. These detections shall be included in the upcoming CCR. **UCMR monitoring for the Fruitridge Vista system is complete and no further monitoring for these chemicals is required at this time.**

Fruitridge Vista Chromium VI and Vanadium Monitoring

Well Number	Chromium VI Monitoring Date (Result)	Vanadium Monitoring Date (Result)
1	ND	1/03 (16 ug/l) 8/03 (14 ug/l)
2	8/01 (3 ug/l)	1/03 (17 ug/l) 8/03 (16 ug/l)
3	1/01 (7 ug/l) 7/01 (6 ug/l)	1/03 (14 ug/l) 7/03 (11 ug/l)
4	1/01 (5 ug/l) 7/01 (5 ug/l)	1/03 (12 ug/l) 7/03 (8 ug/l)
5	1/01 (8 ug/l) 7/01 (7 ug/l)	1/03 (14 ug/l) 7/03 (12 ug/l)
6	1/01 (6 ug/l) 7/01 (6 ug/l)	1/03 (28 ug/l) 7/03 (12 ug/l)
7	1/01 (9 ug/l) 7/01 (9 ug/l)	1/03 (17 ug/l) 7/03 (14 ug/l)
8	1/01 (13 ug/l) 7/01 (10 ug/l)	1/03 (22 ug/l) 7/03 (22 ug/l)
9	1/01 (7 ug/l) 7/01 (7 ug/l)	1/03 (18 ug/l) 7/03 (15 ug/l)
10	1/01 (10 ug/l) 7/01 (11 ug/l)	1/03 (21 ug/l) 7/03 (17 ug/l)
13	1/01 (7 ug/l) 7/01 (8 ug/l)	1/03 (18 ug/l) 7/03 (16 ug/l)
14	1/01 (7 ug/l) 7/01 (4 ug/l)	1/03 (15 ug/l) 7/03 (11 ug/l)
15	ND	ND
16	6/02 (7.8 ug/l) 12/02 (6.8 ug/l)	1/03 (18 ug/l) 7/03 (19 ug/l)
17	6/02 (8.2 ug/l) 12/02 (5.6 ug/l)	1/03 (14 ug/l) 7/03 (17 ug/l)

2.6.2.7 Natural Radioactivity (radium-226,radium-228,uranium):

Previously, Radioactivity monitoring was required to be performed every four years for active wells and once every nine years for standby wells. Compliance with radioactivity standards is based upon the average of the analysis of four consecutive quarterly samples. Monitoring for gross alpha particle activity may be substituted for measurement of radium-226 and radium-228 until gross alpha activity exceeds 5 pCi/l. After gross alpha exceeds 5 pCi/l, monitoring for uranium and combined radium-226 and radium-228 shall be conducted.

The new Federal Radionuclide Rule states that for Gross Alpha of less than 3 pCi/l, subsequent monitoring frequency is one sample every nine years. The new Rule also requires that four consecutive quarterly samples for Radium-228 be collected by December 31, 2007. However, if the first two quarters of monitoring are below the detection limit for the purposes of reporting (DLR), the final two quarters of initial monitoring may be waived.

For Gross Alpha levels of ≥3 and ≤7.5 pCi/l, the monitoring frequency is one sample every 6 years.

For Gross Alpha levels of >7.5 and ≤15 pCi/l, the monitoring frequency is one sample every 3 years.

Last Gross Alpha Monitoring for Fruitridge Vista

Well	Last Monitoring Over 4 Quarters	Average of 4 quarters (includes counting error)	New Monitoring Interval	Next Monitoring Due
1	1/03, 4/03 7/03, 10/03	3.48 pCi/l	1 sample every 6 years.	January 2009
2	1/03, 4/03 7/03, 10/03	5.73 pCi/l	1 sample every 6 years.	January 2009
3	1/03, 4/03 7/03, 10/03	9.62 pCi/l	**1 sample every 3 years.**	January 2006
4	1/03, 4/03 7/03, 10/03	6.12 pCi/l	1 sample every 6 years.	January 2009
5	1/03, 4/03 7/03, 10/03	5.24 pCi/l	1 sample every 6 years.	January 2009
6	1/03, 4/03 7/03, 10/03	2.58 pCi/l	1 sample every 9 years.	January 2012
7	1/03, 4/03 7/03, 10/03	6.6 pCi/l	1 sample every 6 years.	January 2009
8	1/03, 4/03 7/03, 10/03	2.31 pCi/l	1 sample every 9 years.	January 2012
9	1/03, 4/03 7/03, 10/03	1.41 pCi/l	1 sample every 9 years.	January 2012
10	1/03, 4/03 7/03, 10/03	1.63 pCi/l	1 sample every 9 years.	January 2012
11 Inactive	----------	----------	----------	Shall be monitored prior to activation.
12 Inactive	----------	----------	----------	Shall be monitored prior to activation.
13	1/03, 4/03 7/03, 10/03	2.31 pCi/l	1 sample every 9 years.	January 2012
14	1/03, 4/03 7/03, 10/03	2.88 pCi/l	1 sample every 9 years.	January 2012
15 Standby	1/03, 4/03 7/03, 10/03	1.03 pCi/l	1 sample every 9 years.	January 2012
16	1/03, 4/03 7/03, 10/03	1.05 pCi/l	1 sample every 9 years.	January 2012
17	1/03, 4/03 7/03, 10/03	2.69 pCi/l	1 sample every 9 years.	January 2012

2.7 Treated Water and Distribution System Monitoring

2.7.1 Lead and Copper Tap Monitoring

Lead and copper are required to be monitored in distribution systems according to the monitoring schedule established under the Federal Lead and Copper Rule. Subsequently, the State adopted lead and copper rules that provide for a continuation of the Federal lead and copper monitoring program.

Summary of Lead and Copper Tap Monitoring

Sampling Round	Date Completed	No. of Samples	90% Lead (ug/l)	90% Copper (mg/l)
1st Initial	12/92	60	5.8	0.078
2nd Initial	5/93	60	5.8	0.078
Annual	11/93	30	2.0	0.086
Annual	2/96	30	3.0	0.100
1st Triennial	12/03	30	2.5	0.025
2nd Triennial	**Due between June-Sept. 2006**	**Minimum of 30**		

FVWC is currently on triennial (every 3 years) monitoring. In a letter dated December 31, 1997, the Department granted a request from FVWC to reduce the frequency of monitoring from annually to once every three years. As shown in the table above, all previous sampling rounds have yielded results well below the lead action level of 15 ug/l and the copper action level of 1.3 mg/l. All future tap monitoring shall be conducted in June, July, August, or September in the years designated.

2.7.2 Disinfection Byproducts Monitoring

FVWC has a Disinfection Byproducts Monitoring Plan dated December 30, 2003, which lists one sample site located at 6201 41st Street as representative of extended residence time in the distribution system. Quarterly samples are required. Results of March 2004 sampling were non-detect for TTHMs and HAA5s. The free chlorine residual recorded at the time of sampling was 0.25 mg/L.

2.7.3 Distribution Coliform Monitoring

According to the 2003 Annual report's service connection total, the FVWC is required to monitor their water system for bacteriological quality at a frequency of 4 samples per week. The current BSS Plan is dated February 4, 1997 and lists 20 sample sites.

III. APPRAISAL OF SANITARY HAZARDS & PUBLIC HEALTH SAFEGUARDS

The FVWC water system is well maintained and operated. However, there are two primary system vulnerabilities FVWC is aware of and must continue to address. The primary system deficiency or vulnerability appears to be lack of water storage, marginal capacity to meet peak demands, particularly with four wells (2, 11, 12, & 15) exceeding MCLs and not currently available for use at the time of this report, and not enough well sites equipped with backup power generators. A capacity evaluation after the 1997 inspection by the Department indicated that FVWC had sufficient capacity to meet demands at that time. However, recent records indicate that the water use has increased to the point that under peak demand or a high use day concurrent with estimated fire flow requirements, the system capacity may be marginal to deficient.

Adding storage presents a problem due to the fact that the system is located within an older, mostly residential area of Sacramento County, which makes acquiring room for even a relatively small storage tank difficult. Adding additional capacity and additional backup power generators should be a priority with regard to increasing the overall reliability of the system to meet demands, particularly during peak hours, and to enable the system to meet demands during power outages.

If FVWC has not already done so, FVWC should develop a plan and timetable for adding new sources to the FVWC system as well as adding more emergency power backup (generators) to existing wells and/or new wells. FVWC is required to complete their Emergency Response Plan (ERP) that will incorporate the results of the completed Vulnerability Assessment (see Condition No. 9). A section of the ERP should address prolonged power outages that would effect the service area.

The second major vulnerability is in the construction of some of the system's older wells, which have very shallow annular seals. Recurrent bacteriological problems have been seen in these wells and FVWC should continue to closely monitor the wells. Condition No. 7 of this report specifically addresses wellhead monitoring protocol and frequencies. As funds become available, FVWC should continue to upgrade and improve the system's older well sites.

IV. CONCLUSIONS AND RECOMMENDATIONS

The Drinking Water Field Operations Branch has reviewed the operation and current status of the FVWC Water System and has determined that the FVWC is capable of providing a reliable and adequate supply of potable water, which meets all of the primary and secondary drinking water standards. It is therefore

recommended that a domestic water supply permit be issued to the Fruitridge Vista Water Company for the operation of the Fruitridge Vista Domestic Water System, subject to the following conditions:

1. The Fruitridge Vista Water Company shall comply with all the requirements set forth in the California Safe Drinking Water Act, California Health and Safety Code and any regulations, standards or orders adopted thereunder.

2. The only sources approved for potable water supply for the Fruitridge Vista Water Company are as follows:

List of Approved Domestic Sources for the FVWC

Name	Status	Station Code
Well 01	Active Raw	3410023-001
Well 02	Active Raw	3410023-002
Well 03	Active Raw	3410023-003
Well 04	Active Raw	3410023-004
Well 05	Active Raw	3410023-005
Well 06	Active Raw	3410023-006
Well 07	Active Raw	3410023-007
Well 08	Active Raw	3410023-008
Well 09	Active Raw	3410023-009
Well 10	Active Raw	3410023-010
Well 13	Active Raw	3410023-013
Well 14	Active Raw	3410023-014
Well 15-Standby	Standby Raw	3410023-015
Well 16	Active Raw	3410023-016
Well 17	Active Raw	3410023-017

The only approved treatment processes are those that are described in the Engineering Report, which include; sodium hypochlorite injection at the wellhead.

3. No changes, additions, or modifications shall be made to the sources mentioned in Condition No. 2 unless an amended water permit has first been obtained from the Department.

4. Any sources that are made Inactive shall be physically separated from the distribution system so that there is no possibility of an Inactive source pumping into the FVWC distribution system.

5. All water supplied by the Fruitridge Vista Water Company for domestic purposes shall meet all Maximum Contaminant Levels (MCLs) and Action Levels (Als) established by the State Department of Health Services. If the water quality does not comply with the California Drinking Water Standards, treatment shall be provided to meet standards.

6. All personnel who operate the Distribution facilities shall be certified in accordance with Title 22, Section 63770, California Code of Regulations. The Fruitridge Vista Water Company Water System is classified as a D3 water system and as such, the minimum grade for the Chief Operator is D3 and the minimum grade of the Shift Operator is D2.

7. The Fruitridge Vista Water Company shall comply with Title 17 of the California Code of Regulations (CCR), to prevent the water system and treatment facilities from being contaminated from possible cross-connections. The Fruitridge Vista Water Company shall maintain a program for the protection of the domestic water system against backflow from premises having dual or unsafe water systems in accordance with Title 17. All backflow prevention devices shall be tested at least annually.

8. Wellhead bacteriological (Coliform) monitoring shall be performed as directed below:

   Following any total coliform positive sample in a well (raw well water), after disinfection of the well, flushing, and sampling to confirm no free chlorine residual is present, the well shall not be placed back into service until three consecutive negative (10-tube) total coliform samples are confirmed. The Department shall then be contacted, informed of the testing results and a request shall be made to put the well back online. Once back online, the well shall be tested on a weekly basis for two months, biweekly for the next four months, and with no positive coliform results during that period, returned to a monthly testing schedule.

   FVWC shall record the dates and results of weekly, biweekly, and monthly coliform testing for wells that have had to be disinfected due to bacteriological contamination on a standardized table. A copy of the table shall be sent to the Department upon completion of the weekly and biweekly monitoring of previously disinfected wells as confirmation of the completion of the weekly/biweekly testing and the return to routine monthly testing.

   Wells Nos. 1, 2, 3, 4, 6, 8, 10, and 14 shall be monitored routinely on a monthly basis for coliform and the other active system wells shall be monitored at least once every two months. If coliform is detected, the sampling protocol described above is to be followed.

   Additionally, if any of the system wells have been idle for a period of one week or longer, coliform samples shall be taken at initial startup of that well and one hour after continuous operation. If a presence/absence test is used and the result is positive for total coliform, the FVWC shall conduct repeat monitoring within 24 hours using an approved method that provides enumeration of the results. FVWC shall contact the Department's

Sacramento District office in the event of any positive coliform results from any of the system's wells.

9. The FVWC shall plan sufficiently ahead for the design and construction of new sources to preclude the possibility of future water shortages in the service area. Evaluation reports for needed improvements to prevent low pressure and/or water outage conditions shall be submitted to the Department by the month of March of each year. The reports shall include plans for providing additional source capacity as needed.

10. The Bioterrorism Preparedness and Response Act requires community water systems serving a population greater than 3,300 persons but less than 50,000 to conduct a Vulnerability Assessment (VA) of their system and submit the VA and VA certificate of completion to the Environmental Protection Agency (EPA) by June 30, 2004. FVWC reported that the VA for the system is completed. Also required is the development or revision of an Emergency Response Plan (ERP), which will incorporate the results of the VA. The Emergency Response Plan is to be completed within six months of completing the VA and a certification of completion of the ERP must be sent to the Environmental Protection Agency. A copy of the Emergency Response Plan shall be sent to the Department's Sacramento District office.

11. FVWC has a Disinfection Byproducts Monitoring Plan dated December 30, 2003, which lists one sample site located at 6201 41st Street as representative of extended residence time in the distribution system. Quarterly samples are required to be taken and analyzed for TTHM and HAA5. Results of the monitoring shall be sent to the Department's Sacramento District quarterly.

Appendices

STATE OF CALIFORNIA
APPLICATION FOR DOMESTIC WATER SUPPLY PERMIT FROM

Applicant: DJ Nelson Trust dba Fruitridge Vista Water Company
(Enter the name of legal owner, person(s) or organization)

Address: 1108 2nd Street, Sacramento, CA 95814

System Name: Fruitridge Vista Water Company

System Number: 3410023

TO: Department of Health Services
Drinking Water Field Operations Branch
(Address)

Pursuant and subject to the requirements of the California Health and Safety Code, Division 104, Part 12, Chapter 4 (California Safe Drinking Water Act), Article 7, Section 116525, relating to domestic water supply permits, application is hereby made for a domestic water supply permit to operate community
(Applicant should state the type of system, e.g., community,

to add Wells 14, 15, 16 and 17 to the Fruitridge Vista Water Co.
transient-noncommunity, or nontranscient-noncommunity, and the proposed area of services. This application will also be used

water system.
for a change in ownership application.

RECEIVED
JUN 28 2004
DRINKING WATER FIELD OPERATIONS BRANCH - STOCKTON

I (We) declare under penalty of perjury that the statements on this application and on the accompanying attachments are correct to my (our) knowledge and that I (we) are acting under authority and direction of the responsible legal entity under whose name this application is made.

By: Robert C. Cook Jr RT CEO

Title: General Manager

Address: 1108 2nd Street, Sacramento, CA 95814

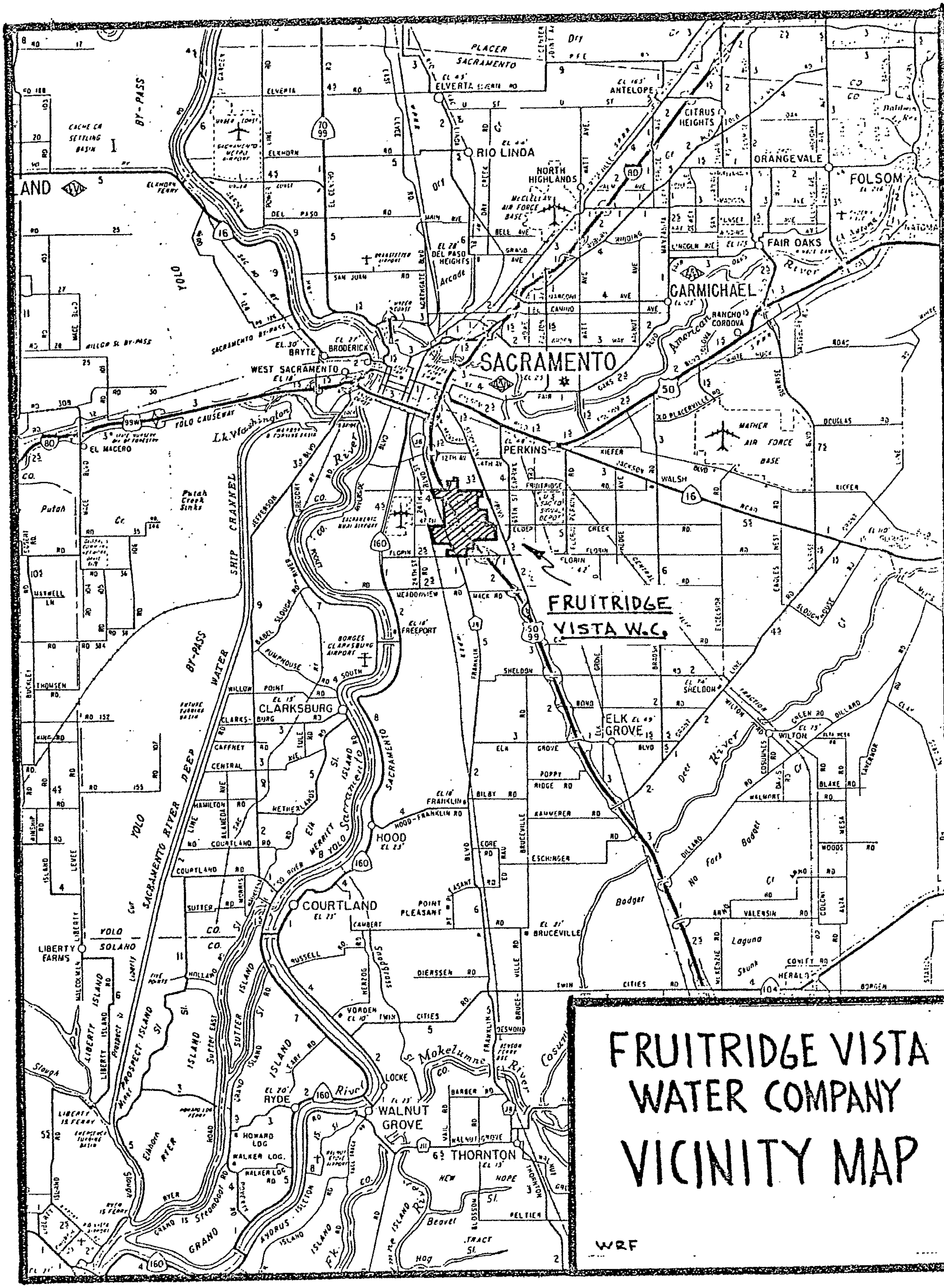
Telephone: 916 443-2607

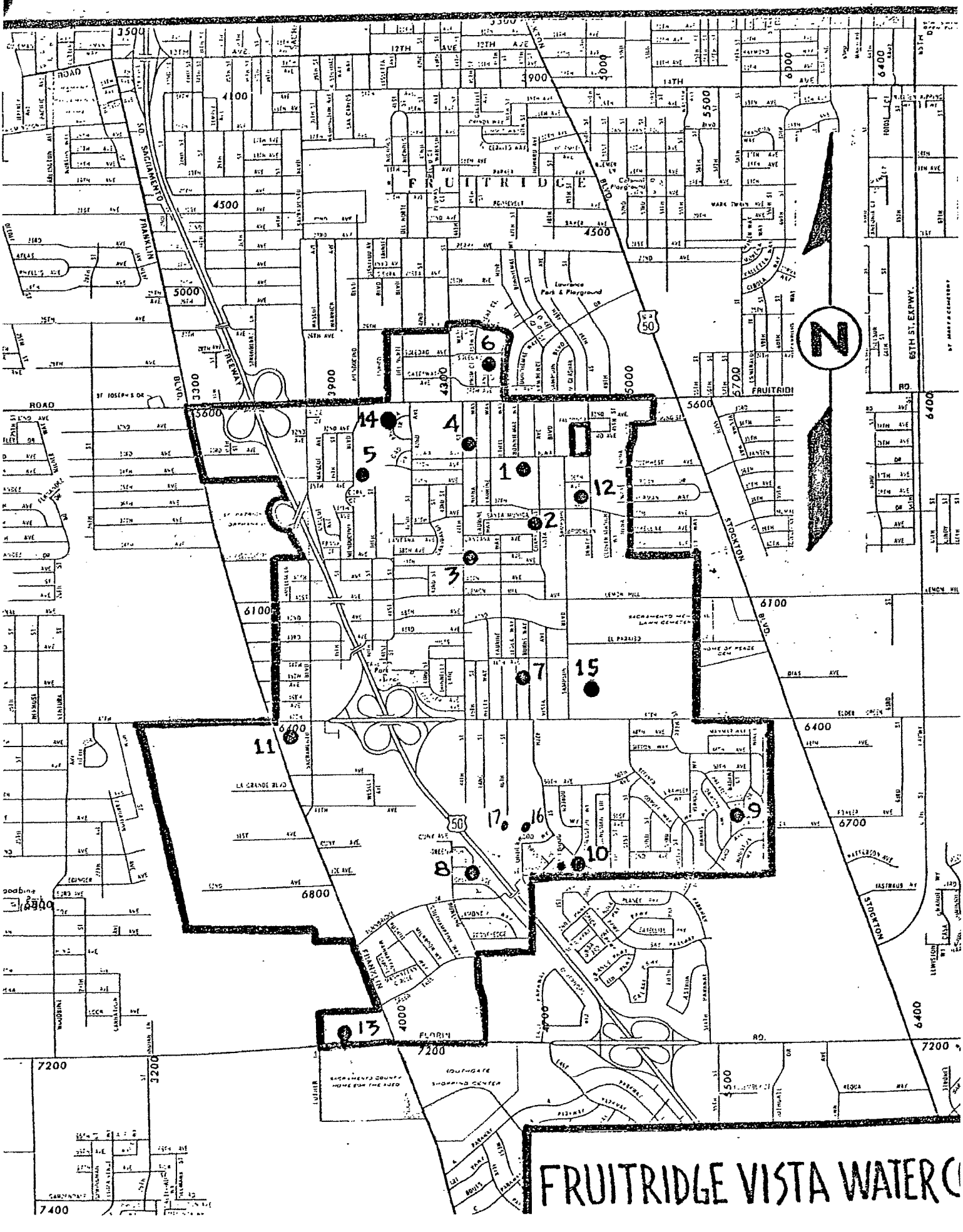
DDW 05/2001

Dated: 6/25/04

Appendix B

Fruitridge Vista Water Company Service Area Map


FRUITRIDGE VISTA
WATER COMPANY
VICINITY MAP
WRF
FRUITRIDGE
VISTA W.C.
SACRAMENTO
WEST SACRAMENTO
BRYTE
BRODERICK
RIO LINDA
NORTH HIGHLANDS
ELVERTA
ANTELOPE
CITRUS HEIGHTS
ORANGEVALE
FOLSOM
FAIR OAKS
CARMICHAEL
RANCHO CORDOVA
PERKINS
MATHER AIR FORCE BASE
FREEPORT
CLARKSBURG
HOOD
FRANKLIN
ELK GROVE
SHELDON
WILTON
COURTLAND
BRUCEVILLE
LOCKE
RYDE
WALNUT GROVE
THORNTON
LIBERTY FARMS
EL MACERO
SACRAMENTO RIVER DEEP WATER SHIP CHANNEL
YOLO BY-PASS
American River
Sacramento River
Mokelumne River
Cosumnes River
Deer Cr
Putah Cr


FRUITRIDGE
FRANKLIN BLVD
STOCKTON BLVD
12TH AVE
14TH AVE
FRUITRIDGE RD.
65TH ST. EXPWY.
Lawrence Park & Playground
Park
SOUTHGATE SHOPPING CENTER
SACRAMENTO COUNTY HOME FOR THE AGED
LA GRANDE BLVD
FLORIN RD.
1
2
3
4
5
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11
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14
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16
17
N
FRUITRIDGE VISTA WATER

STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES

WELL / PUMP DATA

System Name: Fruitridge Vista Water Company
Collected by: David Lancaster
Source of Information: ODW files, field inspection

System No.: 3410023
Date: 06/20/95

	Well 01	Well 02
Well No. or Name	1948	1948
Date Drilled	3410023-001	3410023-002
State Well Number	None	None
DWR Drillers Report No.	4712 Iowa Ave. APN 026-151-0200	4718 37th Ave. APN 026-221-0100
Location	20' x 80'	20' x 45'
Lot Size	Residential	Residential
Neighborhood	No	No
Plot Plan on File?	25'	45'
Distance to Sewer	None known	None known
" to other hazards	400'	60'
" to Abondoned Well	8'	8'
" to Property line	None	None
Flood Hazard?		
Housing? Type.	Metal roof, wood fence siding	Metal roof, wood fence siding
Floor Material	Concrete / Asphalt	Concrete / Gravel
" Height (rel. to grd elev)	Same	Same
" Drainage	Good	Good
Well Depth / Diameter	258'	224'
Casing Depth	104'	138'
" Diameter	10"	10"
" Material	14 gauge rivited steel	14 gauge rivited steel
" Perforation Location / size	None	115'
" Height above Floor	>18"	9"
" Vent Height " "	>36"	>36"
Gravel Pack Location / size	None	None
Conductor casing Depth	66'	64'
Conductor casing Diameter	11"	11"
Surface Sealed?	Yes	Yes
Annular Seal Depth	3'	3'
Annular Seal inner/outer Diam		
Depth to Impervious strata	31'	22'
Impervious strata Thickness	6'	4'
Standing Water Level	62.2' (4/18/95)	46' (4/18/95
Pumping Water Level @ gpm	69.8' @ 452 gpm (4/18/95)	58.5' @ 436 gpm (4/18/95)
Reference Point Elevation		
Reference Point Description	Discharge Centerline	Discharge Centerline
Depth to Bowls	80'	80'
Depth of Airline		
Pump: Type	DWT	DWT
" Make / Model No.	Byron Jackson / 8MQH 10 Stg	Byron Jackson / 10MQH 5 Stg
" Capacity (gpm @ TDH or psi)	452 gpm @ 54 psi (4/18/95)	436 gpm @ 58 psi (4/18/95)
" Lubrication	Oil	Oil
" Power / HP	40 Hp Elect.	40 Hp Elect.
" Auxiliary Power / HP	No	No
" Control Method	Mercoid switch/system pressure	Mercoid switch/system pressure
" Discharge Height (centerline)	36"	28"
" Delivers to.....	System via 5000 gallon pneumatic tank	System via 5000 gallon pneumatic tank
" Discharge Vent Height	>36"	>36"
Discharge Pressure	38-50 psi	40-60 psi
Frequency of use	Auto-on	Auto-on
Meets DWR Standards?	No	No
Remarks and Defects:	Annular seal <50'.	Annular seal <50'.
	<50' from a sewer	<50' from a sewer
	Pump & motor were replaced since 1990	Pump & motor were replaced since 1990
	Historical PCE < MCL	
	Should limit pumping at set drawdown point with probe.	

STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES

WELL / PUMP DATA

System Name: Fruitridge Vista Water Company
Collected by: David Lancaster
Source of Information: ODW files, field inspection

System No.: 3410023
Date: 06/20/95

Well No. or Name	Well 03	Well 04
Date Drilled	1951	1952
State Well Number	3410023-003	3410023-004
DWR Drillers Report No.	None	None
Location	5861 44th St. APN 026-081-0800	5659 44th St. APN 026-213-0200
Lot Size	15' x 40'	15' x 90'
Neighborhood	Residential	Residential
Plot Plan on File?	No	No
Distance to Sewer	**42'**	**49'**
" to other hazards	None known	None known
" to Abondoned Well	**50'**	400'
" to Property line	4'	8'
Flood Hazard?		
Housing? Type.		
Floor Material	Concrete / Gravel	Concrete / Gravel
" Height (rel. to grd elev)	Same	Same
" Drainage	Good	Good
Well Depth / Diameter	315'	270'
Casing Depth	114'	114'
" Diameter	14"	14"
" Material	14 gauge rivited steel	10 gauge steel
" Perforation Location / size		
" Height above Floor	**6"**	**1"**
" Vent Height " "	>36"	>36"
Gravel Pack Location / size	None	None
Conductor casing Depth		
Conductor casing Diameter		
Surface Sealed?	Yes	Yes
Annular Seal Depth	**6'**	**6'**
Annular Seal inner/outer Diam		
Depth to Impervious strata	46'	
Impervious strata Thickness	52'	
Standing Water Level	50' (4/19/95)	55' (4/19/95)
Pumping Water Level @ gpm	77' @ 500 gpm (4/19/95)	64.5 @ 400 gpm (4/19/95)
Reference Point Elevation		
Reference Point Description	Discharge Centerline	Discharge Centerline
Depth to Bowls	80'	80'
Depth of Airline		
Pump: Type	DWT	DWT
" Make / Model No.		
" Capacity (gpm @ TDH or psi)	500 gpm @ 50 psi (4/19/95)	400 gpm @ 55 psi (4/19/95)
" Lubrication	Oil	Water
" Power / HP	30 Hp Elect. (Input Hp on 4/19/95 = 45.1)	30 Hp Elect.
" Auxiliary Power / HP	No	No
" Control Method	Mercoid switch/system pressure	Mercoid switch/system pressure
" Discharge Height (centerline)	16"	12"
" Delivers to.....	System via 5000 gallon pneumatic tank	System via 5000 gallon pneumatic tank
" Discharge Vent Height	>36"	>36"
Discharge Pressure	40-65 psi	45-60 psi
Frequency of use	Auto-on	Auto-on
Meets DWR Standards?	No	No
Remarks and Defects:	Annular seal <50'.	Annular seal <50'.
	<50' from a sewer	<50' from a sewer
	Should lower pump 20'.	Sand separator before P-tank.
		Need to reseal between pump head and pedistal

STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES

WELL / PUMP DATA

System Name: Fruitridge Vista Water Company
Collected by: David Lancaster
Source of Information: ODW files, field inspection

System No.: 3410023
Date: 06/20/95

Well No. or Name	Well 05	Well 06
Date Drilled	1954	
State Well Number	3410023-005	3410023-006
DWR Drillers Report No.	None	None
Location	5800 40th St. APN 026-123-0100	4560 Soledad Ave. APN 022-194-1700
Lot Size	20' x 50'	25' x 50'
Neighborhood	Residential	Residential
Plot Plan on File?	No	No
Distance to Sewer	55'	150'
" to other hazards	None known	None known
" to Abondoned Well	Unknown	100'
" to Property line	10'	5'
Flood Hazard?		
Housing? Type.		
Floor Material	Concrete / Gravel	Concrete / Gravel
" Height (rel. to grd elev)	Same	Same
" Drainage	Good	Good
Well Depth / Diameter	320'	
Casing Depth	180'	
" Diameter	14"	10"
" Material	10 gauge steel	10 gauge steel
" Perforation Location / size	150'	
" Height above Floor	7"	0"
" Vent Height " "	>36"	>36"
Gravel Pack Location / size	None	
Conductor casing Depth	72'	
Conductor casing Diameter	18"	
Surface Sealed?	Yes	
Annular Seal Depth	72'	Unknown
Annular Seal inner/outer Diam		
Depth to Impervious strata		
Impervious strata Thickness		
Standing Water Level	59' (4/19/95)	56' (4/18/95)
Pumping Water Level @ gpm	68.1' @ 545 gpm (4/19/95)	70.5' @ 241 gpm (4/18/95)
Reference Point Elevation		
Reference Point Description	Discharge Centerline	Discharge Centerline
Depth to Bowls	80'	80'
Depth of Airline		
Pump: Type	DWT	DWT
" Make / Model No.		
" Capacity (gpm @ TDH or psi)	545 gpm @ 51 psi (4/19/95)	241 gpm @ 48 psi (4/18/95)
" Lubrication	Water	Oil
" Power / HP	40 Hp Elect.	20 Hp Elect.
" Auxiliary Power / HP	No	No
" Control Method	Mercoid switch/system pressure	Mercoid switch/system pressure
" Discharge Height (centerline)	17"	12"
" Delivers to.....	System via 5000 gallon pneumatic tank	System via 5000 gallon pneumatic tank
" Discharge Vent Height	>36"	>36"
Discharge Pressure	35-55 psi	45-60 psi
Frequency of use	Auto-on	Manual-off (Bacti problem)
Meets DWR Standards?	No	No
Remarks and Defects:	Sand separator before P-tank.	Should limit pumping at set drawdown point with probe. Bacti problem may be related.

STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES

WELL / PUMP DATA

System Name: Fruitridge Vista Water Company **System No.:** 3410023
Collected by: David Lancaster **Date:** 06/20/95
Source of Information: ODW files, field inspection

Well No. or Name	Well 07	Well 08
Date Drilled	1956	1953
State Well Number	3410023-007	3410023-008
DWR Drillers Report No.	None	None
Location	6211 Leola Way APN 037-212-1100	6831 Chevy Chase Way APN 042-062-0900
Lot Size	20' x 60'	20' x 40'
Neighborhood	Residential	Residential
Plot Plan on File?	No	No
Distance to Sewer	55'	105'
" to other hazards	None known	None known
" to Abondoned Well	None known	**25'**
" to Property line	2'	10'
Flood Hazard?		
Housing? Type.	Wood shingle roof, wood fence siding	
Floor Material	Concrete / Gravel	Concrete / Gravel
" Height (rel. to grd elev)	Same	Same
" Drainage	Good	Good
Well Depth / Diameter	300'	387'
Casing Depth	278'	294'
" Diameter	14"	14"
" Material	Steel	10 gauge steel
" Perforation Location / size	162'	138'
" Height above Floor	**9"**	**4"**
" Vent Height " "	>36"	>36"
Gravel Pack Location / size	None	None
Conductor casing Depth		**36'**
Conductor casing Diameter		18"
Surface Sealed?	Yes	Yes
Annular Seal Depth	60'	**36'**
Annular Seal inner/outer Diam		
Depth to Impervious strata	13'	
Impervious strata Thickness	29'	
Standing Water Level	72' (4/19/95)	96' (4/24/95)
Pumping Water Level @ gpm	79.5' @ 668 gpm (4/19/95)	101.3 @ 309 gpm (4/24/95)
Reference Point Elevation		
Reference Point Description	Discharge Centerline	Discharge Centerline
Depth to Bowls	120'	80'
Depth of Airline		
Pump: Type	DWT	DWT
" Make / Model No.	Byron Jackson / 106H 6 Stg	
" Capacity (gpm @ TDH or psi)	668 gpm @ 58 psi (4/19/95)	309 pgm @ 56 psi (4/24/95)
" Lubrication	Oil	Oil
" Power / HP	50 Hp Elect.	20 Hp Elect.
" Auxiliary Power / HP	No	No
" Control Method	Mercoid switch/system pressure	Mercoid switch/system pressure
" Discharge Height (centerline)	30"	12"
" Delivers to.....	System via 5000 gallon pneumatic tank	System via 5000 gallon pneumatic tank
" Discharge Vent Height	>36"	>36"
Discharge Pressure	38-75 psi	40-55 psi
Frequency of use	Auto-on	Auto-on
Meets DWR Standards?	No	No
Remarks and Defects:	Sand separator before P-tank.	Need to investigate PWL vs. depth to bowls!!
	Pump & motor were replaced since 1990	Was abandonned well destroyed properly??
		Bacti problem may be related to above items.
		Need to reseal discharge head bolt holes.

STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES

WELL / PUMP DATA

System Name: Fruitridge Vista Water Company
System No.: 3410023
Collected by: David Lancaster
Date: 06/20/95
Source of Information: ODW files, field inspection

Well No. or Name	Well 09	Well 10
Date Drilled	1958	1960
State Well Number	3410023-009	3410023-010
DWR Drillers Report No.	None	
Location	6602 Wire Dr. APN 039-145-0400	6808 47th St. APN 039-275-0200
Lot Size	20' x 50'	30' x 60'
Neighborhood	Residential	Residential
Plot Plan on File?	No	No
Distance to Sewer	120'	50'
" to other hazards	None known	**30' from canal**
" to Abondoned Well	None known	None known
" to Property line	10'	6'
Flood Hazard?	None	Yes. From Drainage canal
Housing? Type.	Wood shingle roof, wood fence siding	Wood shingle roof, chain-link fence siding
Floor Material	Concrete / Gravel	Concrete / Gravel
" Height (rel. to grd elev)	Same	Same
" Drainage	Good	Good
Well Depth / Diameter	408'	360'
Casing Depth	280'	315'
" Diameter	14" 0-200'; 12' 0-280'	14" 0-205'; 12" 203-315'
" Material	14" 8ga. 0-60' & 10ga. 60-200'; 12" ?? 0-280' Steel	14" 8 ga.; 12" 10 ga.
" Perforation Location / size	218-222', 232-238', 248-249', 250-259', 266-275'	143'
" Height above Floor	18"	18"
" Vent Height " "	>36"	>36"
Gravel Pack Location / size	None	None
Conductor casing Depth	56' and 200'	
Conductor casing Diameter	20" and 14"	
Surface Sealed?	Yes	Yes
Annular Seal Depth	56' and 200'	102'
Annular Seal inner/outer Diam	?? and 12/14"	
Depth to Impervious strata	14'	14'
Impervious strata Thickness	37'	14'
Standing Water Level	60.08'	65.5' (4/24/95)
Pumping Water Level @ gpm	68.50' @ 1000 gpm	80' @ 739 gpm (4/24/95)
Reference Point Elevation		
Reference Point Description	Discharge Centerline	Discharge Centerline
Depth to Bowls	120'	140'
Depth of Airline		
Pump: Type	DWT	DWT
" Make / Model No.	Byron Jackson / 126L 5 Stg	Byron Jackson / 11MQL 5 Stg
" Capacity (gpm @ TDH or psi)	900 gpm @ 60 psi	739 gpm @ 47 psi (4/24/95)
" Lubrication	Oil	Oil
" Power / HP	60 Hp Elect.	50 Hp Elect.
" Auxiliary Power / HP	No	No
" Control Method	System pressure	System pressure
" Discharge Height (centerline)	30"	28"
" Delivers to.....	System via 5000 gallon pneumatic tank	System via 5000 gallon pneumatic tank
" Discharge Vent Height	>36"	>36"
Discharge Pressure	55-65 psi	40-56 psi
Frequency of use	Auto-on	Auto-on
Meets DWR Standards?	No	No
Remarks and Defects:	Sand separator before P-tank.	<50 from drainage canal. Subject to flooding.
	Pump & motor were replaced since 1990	Pump & motor were replaced since 1990
	Well was rehabbed in 1994. 14" casing mill knifed	
	and grouted between new 12" and old 14".	

STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES

WELL / PUMP DATA

System Name: Fruitridge Vista Water Company **System No.:** 3410023
Collected by: David Lancaster **Date:** 06/20/95
Source of Information: ODW files, field inspection

Well No. or Name	Well 11	Well 12
Date Drilled	1962	1964
State Well Number	3410023-011	3410023-012
DWR Drillers Report No.		
Location	3792 47th Ave. APN 039-021-1600	5950 Dewey Blvd. APN 026-223-2700
Lot Size	25' x 50'	30' x 60'
Neighborhood	Commercial	Residential
Plot Plan on File?	No	No
Distance to Sewer	100'	150'
" to other hazards	None known	None known
" to Abondoned Well	None known	None known
" to Property line	15'	10'
Flood Hazard?		
Housing? Type.		
Floor Material	Concrete / Gravel	Concrete / Gravel
" Height (rel. to grd elev)	Same	Same
" Drainage	Good	Good
Well Depth / Diameter	452'	292'
Casing Depth	270'	236'
" Diameter	14"	14"
" Material	Steel	Steel
" Perforation Location / size	113'	170'
" Height above Floor	4"	9"
" Vent Height " "	2 @ >36"	>36"
Gravel Pack Location / size	None	None
Conductor casing Depth	70'	
Conductor casing Diameter	20"	
Surface Sealed?	Yes	Yes
Annular Seal Depth	70'	100'
Annular Seal inner/outer Diam		
Depth to Impervious strata		
Impervious strata Thickness		
Standing Water Level	53.5' (4/24/95)	89' (4/18/95)
Pumping Water Level @ gpm	62' @ 632 gpm (4/24/95)	97.5' @ 474 gpm (4/18/95)
Reference Point Elevation		
Reference Point Description	Discharge Centerline	Discharge Centerline
Depth to Bowls	80'	80'
Depth of Airline		
Pump: Type	DWT	DWT
" Make / Model No.		
" Capacity (gpm @ TDH or psi)	632 gpm @ 58 psi (4/24/95)	474 gpm @ 56 psi (4/18/95)
" Lubrication	Oil	Oil
" Power / HP	50 Hp Elect. (Input Hp on 4/21/95 = 40.7)	50 Hp Elect.
" Auxiliary Power / HP	Diesel generator	Diesel generator
" Control Method	System pressure	System pressure
" Discharge Height (centerline)	14"	18"
" Delivers to.....	System via 5000 gallon pneumatic tank	System via 5000 gallon pneumatic tank
" Discharge Vent Height	>36"	>36"
Discharge Pressure	40-55 psi	40-65 psi
Frequency of use	Auto-on	Auto-on
Meets DWR Standards?	No	No
Remarks and Defects:		Should investigate PWL vs. bowl setting.
		May need to lower pump.
		Pneumatic tank compressor not working.

STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES

WELL / PUMP DATA

System Name: Fruitridge Vista Water Company **System No.:** 3410023
Collected by: David Lancaster **Date:** 06/20/95
Source of Information: ODW files, field inspection

	Well 13	Well 14
Well No. or Name		
Date Drilled	1966	1975
State Well Number	3410023-013	3410023-014
DWR Drillers Report No.		88175
Location	7100 Franklin Blvd. APN 041-120-1100	4129 Apostolo Cir. APN 026-273-3700
Lot Size	30' x 60'	63' x 40' x 27' x 60'
Neighborhood	Commercial	Residential
Plot Plan on File?	No	No
Distance to Sewer	100'	>100'
" to other hazards	None known	None known
" to Abondoned Well	None known	None known
" to Property line	9'	20'
Flood Hazard?		
Housing? Type.		Concrete block wall, wood frame roof
Floor Material	Concrete / Gravel	Concrete
" Height (rel. to grd elev)	Same	Same
" Drainage	Good	Good
Well Depth / Diameter	430'	345'
Casing Depth	405'	336'
" Diameter	14"	14"
" Material	1/4" Steel	1/4" Steel
" Perforation Location / size	120'	158-332' / 1/8"
" Height above Floor	5"	5" (in building)
" Vent Height " "	>36"	>36"
Gravel Pack Location / size	Yes	Yes
Conductor casing Depth	50'	46'
Conductor casing Diameter	30"	30"
Surface Sealed?	Yes	Yes
Annular Seal Depth	50'	**46'**
Annular Seal inner/outer Diam		30 / 36"
Depth to Impervious strata		19'
Impervious strata Thickness		22'
Standing Water Level	44.8' (4/24/95)	64' (4/19/95)
Pumping Water Level @ gpm	110.4' @ 1160 gpm (4/24/95)	81.5' @ 755 gpm (4/19/95)
Reference Point Elevation		
Reference Point Description	Discharge Centerline	Discharge Centerline
Depth to Bowls	160' (7/8/93)	100'
Depth of Airline		
Pump: Type	DWT	DWT
" Make / Model No.		Johnston / 12CC
" Capacity (gpm @ TDH or psi)	1160 gpm @ 64 psi (4/24/95)	755 gpm @ 59 psi (4/19/95)
" Lubrication	Oil	Oil
" Power / HP	100 Hp Elect.	60 Hp Elect.
" Auxiliary Power / HP	No	Yes
" Control Method	System pressure	System pressure
" Discharge Height (centerline)	17"	17"
" Delivers to.....	System via 5000 gallon pneumatic tank	System via 5000 gallon pneumatic tank
" Discharge Vent Height	>36"	>36"
Discharge Pressure	45-55 psi	40-55 psi
Frequency of use	Auto-on (Off during winter)	Auto-on
Meets DWR Standards?	No	No
Remarks and Defects:	Behind Cal Worthingtons	High risk to site vandalism. Should replace fencing
	Removed VFD	

STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES

WELL / PUMP DATA

System Name: Fruitridge Vista Water Company
Collected by: David Lancaster
Source of Information: ODW files, field inspection

System No.: 3410023
Date: 06/20/95

	Well 15	Well 16
Well No. or Name	1983	1999
Date Drilled	3410023-015	3410023-016
State Well Number	75865	700973
DWR Drillers Report No.	5351 47th Ave. APN 037-301-0600	6540 Vernace Way
Location	30' x 50'	5520 sf
Lot Size	Residential	Residential
Neighborhood	No	No
Plot Plan on File?	>100'	50'
Distance to Sewer	None known	Not Known
" to other hazards	None known	Not Known
" to Abondoned Well	12'	Not Known
" to Property line	None	None
Flood Hazard?		
Housing? Type.	Concrete block wall, metal roof	Concrete block building
Floor Material	Concrete	Concrete
" Height (rel. to grd elev)	6"	Same
" Drainage	Good	Good
Well Depth / Diameter	810'	300'
Casing Depth	600'	300'
" Diameter	12" 0-338'; 8" 338-600'	16" 0-300'
" Material	0.188" Steel	0.312" Steel
" Perforation Location / size	340-360, 400-420, 440-?, 540-580'	225-290'
" Height above Floor	18"	18"
" Vent Height " "	>36"	>36"
Gravel Pack Location / size	None	Yes
Conductor casing Depth	278.5'	35'
Conductor casing Diameter	14"	36"
Surface Sealed?	Yes	Yes
Annular Seal Depth	50'	180'
Annular Seal inner/outer Diam		Unknown
Depth to Impervious strata	8'	Unknown
Impervious strata Thickness	13'	Unknown
Standing Water Level	57.5' (4/24/95)	58' (4/27/99)
Pumping Water Level @ gpm	83' @ 758 gpm (4/24/95)	97' @1,000 gpm (4/27/99)
Reference Point Elevation		Unknown
Reference Point Description	Discharge Centerline	Discharge Centerline
Depth to Bowls	110'	120'
Depth of Airline		Unknown
Pump: Type	DWT	DWT
" Make / Model No.	Peabody-Floway / 12D0L-4	Floway
" Capacity (gpm @ TDH or psi)	758 gpm @ 53 psi (4/24/95)	1,230 gpm
" Lubrication	Oil	Water
" Power / HP	75 Hp elect.	100 hp electric
" Auxiliary Power / HP	No	Yes
" Control Method	Mercoid switch/system pressure	System Pressure
" Discharge Height (centerline)	30"	
" Delivers to.....	System	System
" Discharge Vent Height	>36"	>36'
Discharge Pressure	20-35 psi	
Frequency of use	Auto-on (fire protection only)	Auto-on
Meets DWR Standards?		Yes
Remarks and Defects:	No permit on file for this source	No permit on file for this source.
	Dept approved well for fire use only.	
	(See 11/23/83 letter with conditions.)	
	Historical Mn > MCL	

APPENDIX E
Urban Water Management Planning Act

Appendix A

Urban Water Management Plan Act

Established: AB 797, Klehs, 1983
Amended: AB 2661, Klehs, 1990
AB 11X, Filante, 1991
AB 1869, Speier, 1991
AB 892, Frazee, 1993
SB 1017, McCorquodale, 1994
AB 2853, Cortese, 1994
AB 1845, Cortese, 1995
SB 1011, Polanco, 1995
AB 2552, Bates, 2000
SB 553, Kelley, 2000
SB 610, Costa, 2001
AB 901, Daucher, 2001
SB 672, Machado, 2001
SB 1348, Brulte, 2002
SB 1384 Costa, 2002
SB 1518 Torlakson, 2002
AB 105, Wiggins, 2003

CALIFORNIA WATER CODE DIVISION 6
PART 2.6. URBAN WATER MANAGEMENT PLANNING
CHAPTER 1. GENERAL DECLARATION AND POLICY

10610. This part shall be known and may be cited as the "Urban Water Management Planning Act."

10610.2. (a) The Legislature finds and declares all of the following:
(1) The waters of the state are a limited and renewable resource subject to ever-increasing demands.
(2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.
(3) A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate.
(4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years.
(5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.
(6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.
(7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.
(8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.
(9) The quality of source supplies can have a significant impact on water management strategies and supply reliability.
(b) This part is intended to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies to meet existing and future demands for water.
10610.4. The Legislature finds and declares that it is the policy of the state as follows:
(a) The management of urban water demands and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.
(b) The management of urban water demands and efficient use of urban water supplies shall be a guiding criterion in public decisions.

(c) Urban water suppliers shall be required to develop water management plans to actively pursue the efficient use of available supplies.

CHAPTER 2. DEFINITIONS

10611. Unless the context otherwise requires, the definitions of this chapter govern the construction of this part.
10611.5. "Demand management" means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.
10612. "Customer" means a purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.
10613. "Efficient use" means those management measures that result in the most effective use of water so as to prevent its waste or unreasonable use or unreasonable method of use.
10614. "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of such an entity.
10615. "Plan" means an urban water management plan prepared pursuant to this part. A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The plan shall address measures for residential, commercial, governmental, and industrial water demand management as set forth in Article 2 (commencing with Section 10630) of Chapter 3. In addition, a strategy and time schedule for implementation shall be included in the plan.
10616. "Public agency" means any board, commission, county, city and county, city, regional agency, district, or other public entity.
10616.5. "Recycled water" means the reclamation and reuse of wastewater for beneficial use.
10617. "Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

CHAPTER 3. URBAN WATER MANAGEMENT PLANS

Article 1. General Provisions

10620.

(a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).

(b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.

(c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.

(d)(1) An urban water supplier may satisfy the requirements of this part by participation in area wide, regional, watershed, or basin wide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.

(2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

(e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.

(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

10621.

(a) Each urban water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero.

(b) Every urban water supplier required to prepare a plan pursuant to this part shall notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

(c) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).

Article 2. Contents of Plans

10630. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

(a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a). If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:

(1) An average water year.

(2) A single dry water year.

(3) Multiple dry water years.

For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

(d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

(e)(1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses:

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(I) Agricultural.

(2) The water use projections shall be in the same five-year increments described in subdivision (a).

(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:

(A) Water survey programs for single-family residential and multifamily residential customers.

(B) Residential plumbing retrofit.

(C) System water audits, leak detection, and repair.

(D) Metering with commodity rates for all new connections and retrofit of existing connections.

(E) Large landscape conservation programs and incentives.

(F) High-efficiency washing machine rebate programs.

(G) Public information programs.

(H) School education programs.

(I) Conservation programs for commercial, industrial, and institutional accounts.

(J) Wholesale agency programs.

(K) Conservation pricing.

(L) Water conservation coordinator.

(M) Water waste prohibition.

(N) Residential ultra-low-flush toilet replacement programs.

(2) A schedule of implementation for all water demand management measures proposed or described in the plan.

(3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.

(4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.

(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:

(1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.

(2) Include a cost-benefit analysis, identifying total benefits and total costs.

(3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.

(4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.

(h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

(i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

(j) Urban water suppliers that are members of the California Urban Water Conservation Council and submit annual reports to that council in accordance with the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated September 1991, may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g).

(k) Urban water suppliers that rely upon a wholesale agency for a source of water , shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water -year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).

10631.5. The department shall take into consideration whether the urban water supplier is implementing or scheduled for implementation, the water demand management activities that the urban water supplier identified in its urban water management plan, pursuant to Section 10631, in evaluating applications for grants and loans made available pursuant to Section 79163. The urban water supplier may submit to the department copies of its annual reports and other relevant documents to assist the department in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities.

10632. The plan shall provide an urban water shortage contingency analysis that includes each of the following elements that are within the authority of the urban water supplier:

(a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.

(b) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.

(c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

(d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.

(e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

(f) Penalties or charges for excessive use, where applicable.

(g) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

(h) A draft water shortage contingency resolution or ordinance.

(i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

(b) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

(c) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

(d) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

(e) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

(f) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

Article 2.5 Water Service Reliability

10635. (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

(b) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

(c) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

(d) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

Article 3. Adoption and Implementation of Plans

10640. Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630). The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

10641. An urban water supplier required to prepare a plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

10643. An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.

10644. (a) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

(b) The department shall prepare and submit to the Legislature, on or before December 31, in the years ending in six and one, a report summarizing the status of the plans adopted pursuant to this part. The report prepared by the department shall identify the outstanding elements of the individual plans. The department shall provide a copy of the report to each urban water supplier that has filed its plan with the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans submitted pursuant to this part.

10645. Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

CHAPTER 4. MISCELLANEOUS PROVISIONS

10650. Any actions or proceedings to attack, review, set aside, void, or annul the acts or decisions of an urban water supplier on the grounds of noncompliance with this part shall be commenced as follows:

(a) An action or proceeding alleging failure to adopt a plan shall be commenced within 18 months after that adoption is required by this part.

(b) Any action or proceeding alleging that a plan, or action taken pursuant to the plan, does not comply with this part shall be commenced within 90 days after filing of the plan or amendment thereto pursuant to Section 10644 or the taking of that action.

10651. In any action or proceeding to attack, review, set aside, void, or annul a plan, or an action taken pursuant to the plan by an urban water supplier on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the supplier has not proceeded in a manner required by law or if the action by the water supplier is not supported by substantial evidence.

10652. The California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) does not apply to the preparation and adoption of plans pursuant to this part or to the implementation of actions taken pursuant to Section 10632. Nothing in this part shall be interpreted as exempting from the California Environmental Quality Act any project that would significantly affect water supplies for fish and wildlife, or any project for implementation of the plan, other than projects implementing Section 10632, or any project for expanded or additional water supplies.

10653. The adoption of a plan shall satisfy any requirements of state law, regulation, or order, including those of the State Water Resources Control Board and the Public Utilities Commission, for the preparation of water management plans or conservation plans; provided, that if the State Water Resources Control Board or the Public Utilities Commission requires additional information concerning water conservation to implement its existing authority, nothing in this part shall be deemed to limit the board or the commission in obtaining that information. The requirements of this part shall be satisfied by any urban water demand management plan prepared to meet federal laws or regulations after the effective date of this part, and which substantially meets the requirements of this part, or by any existing urban water management plan which includes the contents of a plan required under this part.

10654. An urban water supplier may recover in its rates the costs incurred in preparing its plan and implementing the reasonable water conservation measures included in the plan. Any best water management practice that is included in the plan that is identified in the "Memorandum of Understanding Regarding Urban Water Conservation in California" is deemed to be reasonable for the purposes of this section.

10655. If any provision of this part or the application thereof to any person or circumstances is held invalid, that invalidity shall not affect other provisions or applications of this part which can be given effect without the invalid provision or application thereof, and to this end the provisions of this part are severable.

10656. An urban water supplier that does not prepare, adopt, and submit its urban water management plan to the department in accordance with this part, is ineligible to receive funding pursuant to Division 24 (commencing with Section 78500) or Division 26 (commencing with Section 79000), or receive drought assistance from the state until the urban water management plan is submitted pursuant to this article.

10657. (a) The department shall take into consideration whether the urban water supplier has submitted an updated urban water management plan that is consistent with Section 10631, as amended by the act that adds this section, in determining whether the urban water supplier is eligible for funds made available pursuant to any program administered by the department.

(b) This section shall remain in effect only until January 1, 2006, and as of that date is repealed, unless a later enacted statute, that is enacted before January 1, 2006, deletes or extends that date.

APPENDIX F

Fruitridge Vista Water Company CPUC Rate Structure

Schedule No. 1
METERED SERVICE

APPLICABILITY

Applicable to all metered water service.

TERRITORY

In the unincorporated areas known as Fruitridge Vista Units, Sandra Heights, Pacific Terrace Units, Bowling Green Units, and all immediately adjoining territory in Sacramento County including all territory contiguous to the southerly limits of the City of Sacramento.

RATES

Quantity Rate:

All Water, per 100 cubic feet..... $0.467

Service Charge:

	Per Meter Per Month	
For 5/8 x 3/4 - inch meter	$ 11.11	(I)
For 3/4 - inch meter	16.67	|
For 1 - inch meter	27.78	|
For 1-1/2 - inch meter	55.54	|
For 2 - inch meter	88.86	|
For 3 - inch meter	166.57	|
For 4 - inch meter	277.65	|
For 6 - inch meter	555.29	(I)

This service charge is a readiness to serve charge which is applicable to all metered service and to which is added the charge for water used computed at the Quantity Rate.

SPECIAL CONDITIONS

1. A late charge will be imposed per Schedule LC.
2. In accordance with Section 2714 of the Public Utilities Code, if a tenant in a rental unit leaves owing the company, service to subsequent tenants in the unit will, at the company's option, be furnished on the account of the landlord or property owner.
3. All bills are subject to the reimbursement fee set forth in Schedule No. UF.
4. A portion of each service charge will be deposited in a separate trustee account and shall be used only for payment of principal and interest associated with the buy-in fee for rights purchase water from the City of Sacramento as adopted by the Commission in D.06-04-073. The portion of each service charge that will be deposited in a separate trustee account shall be as follows: for each 5/8" x ¾" meter, $1.25; ¾" meter, $1.88; 1" meter, $3.13; 1 ½" meter, $6.25; 2" meter, $10.00; 3" meter, $18.75; 4" meter, $31.25, and 6" meter, $62.50.
5. All bills are subject to the surcharge set forth in Schedule No. DHS.

(D)

(To be inserted by Utility)
Advice Letter No. 85
Decision No.

Issued By
Robert C. Cook, Jr.
NAME
General Mgr.
TITLE

(To be inserted by Cal.P.U.C.)
Date Filed FEB 15 2008
Effective JUL 15 2008
Resolution No. W 4696

Schedule No. 2
FLAT RATE SERVICE

APPLICABILITY

Applicable to all flat rate water service.

TERRITORY

In the unincorporated areas known as Fruitridge Vista Units, Sandra Heights, Pacific Terrace Units, Bowling Green Units; and all immediately adjoining territory in Sacramento County including all territory contiguous to the southerly limits of the City of Sacramento.

RATES

	Per Service Connection Per Month	
1. For a single residential unit, including Premises not exceeding 10,000 sq. ft. in area	$ 21.63	(I)
a) For each additional single family unit on the same premise and served from the same service connection	$ 13.58	(I)
b) For each 100 sq. ft. of premises in Excess of 10,000 sq. ft.	$ 0.31	(I)
2. For each automobile service station, including car wash rack, where service connection is not larger than one inch in diameter	$ 44.69	(I)

SPECIAL CONDITIONS

1. The above flat rates apply to a service connection not larger than one inch in diameter.
2. If the utility so elects, a meter shall be installed and water served under Schedule No. 1, Metered Service.
3. A late charge will be imposed per Schedule No. LC.
4. In accordance with Section 2714 of the Public Utilities Code, if a tenant in a rental unit leaves owing the company, service to subsequent tenants in the unit will, at the company's option, be furnished on the account of the landlord or property owner.
5. All bills are subject to the reimbursement fee set forth on Schedule No. UF.
6. A portion of each service charge will be deposited in a separate trustee account and shall be used only for payment of principle and interest associated with the buy-in fee for rights purchase water from the City of Sacramento as adopted by the Commission in D.06-04-073. The portion of each service charge that will be deposited in a separate trustee account shall be as follows: each single residential unit $1.65; each additional single family unit $0.99; for each 100 sq. ft. of premises in excess of 10,000 sq. ft. $0.01; and each automobile service station $3.30.
7. All bills are subject to the surcharge set forth in Schedule No. DHS.

(D)

(To be inserted by Utility)
Advice Letter No. 86

Robert C. Cook, Jr.
NAME

President
TITLE

(To be inserted by P.U.C.)
Date Filed FEB 15 2008

Effective JUL 15 2008

Decision No.

General Mgr.
TITLE

Resolution No. W 4696

APPENDIX G

Fruitridge Water News Consumer Confidence Report

FRUITRIDGE WATER NEWS

FRUITRIDGE VISTA WATER COMPANY
2007 CONSUMER CONFIDENCE REPORT

About Your Water Supply
Fruitridge Vista Water supplies groundwater from 13 wells that are located throughout our service area. During 2007 Fruitridge Vista Water Company pumped 1.4 billion gallons of water.

BASIC INFORMATION ABOUT DRINKING WATER CONTAMINANTS

In order to ensure that tap water is safe to drink, the U.S. Environmental Protection Agency (USEPA) and the State Department of Public Health (Department) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. Department regulations also establish limits for contaminants in bottled water that must provide the same protection for public health.

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

- Microbial contaminants, such as viruses and bacteria, that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- Inorganic contaminants, such as salts and metals, that can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.
- Organic chemical contaminants, including synthetic and volatile organic chemicals, that are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, agricultural application and septic systems.
- Radioactive contaminants, which can be naturally-occurring or be the result of oil and gas production and mining activities.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. USEPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

An assessment of the drinking water sources for Fruitridge Vista Water Company was completed in June of 2003. The sources are considered most vulnerable to the following activities associated with contaminants detected in the water supply: gas stations, dry cleaners, historic gas stations, and leaking underground storage tanks. In addition the sources are considered most vulnerable to these activities not associated with any detected contaminants: automobile repair shops, chemical/petroleum pipelines and sewer collection systems. A summary of the assessment can be viewed at http://swap.ice.ucdavis.edu/TSinfo/TSsources.asp?mySystem=3410023. You may request a summary of the assessment be sent to you by contacting Fruitridge Vista Water at 916-443-2607.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline (1-800-426-4791)

Terms used in this report	
Term	**Definition**
Primary Drinking Water Standards (PDWS)	MCLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.
Secondary Drinking Water Standards (SDWS)	MCL's for contaminants that affect taste, odor, or appearance of the drinking water. Contaminants with SDWSs do not affect the health at the MCL levels.
Maximum Contaminant Level (MCL)	The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.
Regulatory Action Level (AL)	The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.
Maximum Contaminant Level Goal (MCLG)	The level of contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the U.S. Environmental Protection Agency (USEPA).
Public Health Goal (PHG)	The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.
Maximum Residual Disinfectant Level (MRDL)	The level of a disinfectant added for water treatment that may not be exceeded at the consumer's tap.
Maximum Residual Disinfectant Goal (MRDLG)	The level of a disinfectant added for water treatment below which there is no known or expected risk to health. MRDLGs are set by the U.S. Environmental Protection Agency.
Unregulated Contaminant Requiring Monitoring	Contaminants with no MCL for which Department or federal rules require monitoring. Unregulated contaminant monitoring helps EPA and the Department to determine where certain contaminants occur and whether the contaminants need to be regulated.

While water conservation is always good practice, the loss of wells to MTBE contamination makes it necessary to do the following:

WATER SHORTAGE CRISIS: Because there is a possibility that the Fruitridge Vista Water Company supply or distribution system will not be able to meet all the water demands of its customers we are implementing the following Water Conservation Rules. These rules will become effective July 1 and will remain in effect through October 15, corresponding to the normal period of highest water consumption. We ask your full cooperation in complying with these rules so that all may benefit.

When watering is required, water only on the days based on your street address number: Addresses ending with an even number should water only on Wednesday and Sunday. Addresses ending with an odd number should water only on Tuesday and Saturday. No outside watering should be done on Monday, Thursday and Friday. Automatic sprinkler system timers shall be set to operate only during off-peak hours between 12:01 a.m. and 6:00 a.m. Watering is prohibited between the hours of 6:00 and 7:00 am. Water shall be confined to consumer's property and shall not be allowed to run off onto adjoining property or to the roadside ditch or gutter. Care should be taken not to water past the point of saturation.

Free flowing hoses are prohibited for all uses. Automatic shut off devices shall be installed on any hose or filling apparatus in use.

Leaking consumer pipes or faulty sprinklers shall be repaired within 5 days or less if warranted by the severity of the problem.

Washing of streets, parking lots, driveways, sidewalks or buildings is prohibited except as necessary for sanitary or fire protection purposes.

Washing of automobiles or equipment shall be done on the lawn or at a commercial establishment that uses recycled or reclaimed water.

Restaurants are asked to serve water only on specific request.

Water use for ponds and ornamental fountains is prohibited. No potable water shall be used to fill or refill new swimming pools, artificial lakes, ponds or streams until the water crisis has been declared over.

Fruitridge Vista Water Company personnel will be out on a routine basis to encourage compliance with these rules. Please contact us should you have any questions concerning this policy.

Este informe contiene información muy importante sobre su agua beber. Tradúzcalo ó hable con alguien que lo entienda bien.

FRUITRIDGE VISTA WATER COMPANY

Year 2007 Consumer Confidence Report

The following tables list all of the drinking water contaminants that were detected during the most recent sampling for the constituent.
The presence of these contaminants in the water does not necessarily indicate that the water poses a health risk.

CONSTITUENT	UNITS	MCL (MRDL)	PHG (MCLG) [MRDLG]	SAMPLE DATE	WEIGHTED AVERAGE	RANGE MIN.	RANGE MAX.	Typical Source of Contaminant
CONSTITUENTS WITH A PRIMARY DRINKING WATER STANDARD								
Radioactive								
Gross Alpha	pCi/L	15	(0)	2007	1.8	0	11.5	Erosion of natural deposits
Natural Uranium	pCi/L	20	0.43	2007	1.0	ND	6.7	Erosion of natural deposits
Radium 228	pCi/L	5	0	2007	0.04	0	1.4	Erosion of natural deposits
Inorganic								
Arsenic*	ppb	50	0.004	2006	4.17	3	6	Erosion of natural deposits; runoff from orchards; glass and electronics production wastes
Barium	ppm	1	2	2006	0.05	ND	0.19	Discharges of oil drilling wastes and from metal refineries; erosion of natural deposits
Chromium	ppb	50	(100)	2006	0.49	ND	21	Discharge from steel and pulp mills and chrome plating; erosion of natural deposits
Nitrate (as NO3)**	ppm	45	45	2007	11.95	3	32	Runoff and leaching from fertilizer use; leaching from septic tanks and sewage; erosion of natural deposits
Volatile Organic								
Tetrachloroethylene (PCE)	ppb	5	0.06	2007	0.0009	ND	2	Discharge from factories, dry cleaners and auto shops (metal degreaser)
Trichloroethylene (TCE)	ppb	5	0.8	2007	0.0002	ND	1	Discharge from metal degreasing sites and other factories
Disinfection Byproducts, Disinfectant Residuals, and Disinfection Byproduct Precursors								
TTHM's (Total Trihalomethanes)	ppb	80	none	2007	0.65	ND	2.6	Byproduct of drinking water chlorination
Chlorine	ppm	(4)	[4]	2007	0.65	0.3	1.1	Drinking water disinfectant added for treatment
Chlorine Dioxide***	ppb	(800)	[800]	2007	750	0	2000	Drinking water disinfectant added for treatment
CONSTITUENTS WITH A SECONDARY DRINKING WATER STANDARD								
Aluminum	ppb	200	none	2006	0.6	ND	100	Erosion of natural deposits; residue from some surface water treatment processes
Color	units	15	none	2006	1.00	ND	25	Naturally-occurring organic materials
Iron (Fe)	ppb	300	none	2006	0.7	ND	470	Leaching from natural deposits; industrial wastes
Odor	units	3	none	2006	1	1	1	Naturally-occurring organic materials
Turbidity	units	5	none	2006	0.3	ND	7.5	Soil runoff
Total Filterable Residue (TDS)	ppm	1000	none	2006	244	160	450	Runoff/leaching from natural deposits
Specific Conductance	umho/cm	1600	none	2006	344.0	200	670	Substances that form ions when in water; seawater influence
Chloride	ppm	500	none	2006	18	6	67	Runoff/leaching from natural deposits; seawater influence
Manganese	ppb	50	none	2006	9.6	ND	94	Leaching from natural deposits
Sulfate	ppm	500	none	2006	10.2	ND	34	Runoff/leaching from natural deposits; industrial wastes

ADDITIONAL WATER QUALITY PARAMETERS OF INTEREST

Constituent	Units	Sample Date	Average Amount Detected	Range Low-High
Sodium	ppm	2006	14.1	11-21
Hardness	ppm	2006	137.3	34-300
Bicarbonate (HCO3)	ppm	2006	160.5	110-290
Total Alkalinity (as CaCO3)	ppm	2006	132.0	88-240
Calcium	ppm	2006	31.4	17-66
Magnesium	ppm	2006	14.7	6.4-34
pH	pH units	2006	8	7.7-8.1

LEAD and COPPER

CONSTITUENT	UNITS	SAMPLE DATE	Number of Samples Collected	90th Percentile Level Detected	Number of Sites Exceeding AL	AL	MCLG	Typical Source of Contaminant
Lead	ppb	2006	30	2.5	0	15	2	Internal corrosion of household water plumbing systems; discharges from industrial manufacturers; erosion of natural deposits.
Copper	ppm	2006	30	0.16	0	1.3	0.17	Internal corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives.

UNREGULATED CONTAMINANTS

CONSTITUENT	UNITS	SAMPLE DATE	LEVEL DETECTED Average (Range)	ACTION LEVEL	HEALTH EFFECTS
Chromium - Hexavalent	ppb	2002	5.15 (4-6.8)	n/a	n/a
1,2,3-Trichloropropane****	ppb	2006	0.0006 (ND-0.13)	0.005	Some people who use water containing 1,2,3-trichloropropane in excess of the action level over many years may have an increased risk of getting cancer based on studies in laboratory animals.
Vanadium	ppb	2003	12.4 (8-22)	50	The babies of some pregnant women who drink water containing vanadium in excess of the action level may have an increased risk of developmental effects, based on studies in laboratory animals.

***While your drinking water meets the current EPA standard for ARSENIC, it does contain low levels of arsenic. The arsenic standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. The U.S. Environmental Protection Agency continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems.**

****NITRATE in drinking water at levels above 45 mg/L (ppm) is a health risk for infants of less than six months of age. Such nitrate levels in drinking water can interfere with the capacity of the infant's blood to carry oxygen, resulting in serious illness; symptoms include shortness of breath and blueness of the skin. Nitrate levels above 45 mg/L may also affect the ability of the blood to carry oxygen in other individuals, such as pregnant women and those with certain specific enzyme deficiencies. If you are caring for an infant, or if you are pregnant, you should ask advice from your health care provider.**

*****Some infants and young children who drink water containing CHLORINE DIOXIDE in excess of the MRDL could experience nervous system effects. Similar effects could occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people experience anemia.**

******TRICHLOROPROPANE (1,2,3-TCP) in drinking water is currently an "unregulated contaminant requiring monitoring." The California Department of Health Services has established an "action level" of 0.005 ppb for this chemical. The Company discovered in 2003 that this concentration is being exceeded in the water produced by Well No. 13. 1,2,3-TCP is a breakdown product of an agricultural chemical. The Company has submitted an application for state funding in order to remove this chemical from the water and currently the well is used only in periods of higher demand . Some people who use water containing 1,2,3-TCP in excess of the action level over many years may have an increased cancer risk based on studies in laboratory animals. SEE REVERSE FOR DEFINITIONS OF "UNREGULATED CONTAMINANTS" AND "ACTION LEVEL".**

IF ANY OF THESE WARNINGS ARE OF CONCERN TO YOU PLEASE REFER TO THE PARAGRAPH BEGINNING "Some people may be more vulnerable" ON THE REVERSE SIDE.

ppm.....parts per million or milligrams per liter (mg/L)
ppb.....parts per billion or micrograms per liter (ug/L)
pCi/L.....picocuries per liter (a measure of radiation)
ND.....Not detectable at testing limit
umhos/cm.....micromhos per centimeter
N/A.....Not Applicable

The department requires us to monitor for certain contaminants less than once per year because the concentrations of these contaminants are not expected to vary significantly from year to year. Some of the data, though representative of water quality, are more than one year old.

If you have any questions about Fruitridge Vista Water Company's water quality, or need assistance in any other way, please contact Beth Arnoldy at (916) 443-2607. We will be glad to assist you if we can. Additionally, you will be notified by mail or in the Public Notices section of the Sacramento Bee of any public meetings at which you can participate.

RULE N0. 14.1
WATER CONSERVATION AND RATIONING PLAN

GENERAL INFORMATION

If water supplies are projected to be insufficient to meet normal customer demand, and are beyond the control of the utility, the utility may elect to implement voluntary conservation using the portion of this plan set forth in Section A of this Rule after notifying the Commission's Water Division of its intent. If, in the opinion of the utility, more stringent water measures are required, the utility shall request Commission authorization to implement the mandatory conservation and rationing measures set forth in Section B.

The Commission shall authorize mandatory conservation and rationing by approving Schedule No. 14.1, Mandatory Water Conservation and Rationing. When Schedule No. 14.1 has expired, or is not in effect, mandatory conservation and rationing measures will not be in force. Schedule No. 14.1 will set forth water use violation fines, charges for removal of flow restrictors, and the period during which mandatory conservation and rationing measures will be in effect.

When Schedule No. 14.1 is in effect and the utility determines that water supplies are again sufficient to meet normal demands, and mandatory conservation and rationing measures are no longer necessary, the utility shall seek Commission approval to rescind Schedule No. 14.1 to discontinue rationing.

In the event of a water supply shortage requiring a voluntary or mandatory program, the utility shall make available to its customers water conservation kits as required by Rule 20. The utility shall notify all customers of the availability of conservation kits.

(continued)

RULE N0. 14.1
WATER CONSERVATION AND RATIONING PLAN

GENERAL INFORMATION

If water supplies are projected to be insufficient to meet normal customer demand, and are beyond the control of the utility, the utility may elect to implement voluntary conservation using the portion of this plan set forth in Section A of this Rule after notifying the Commission's Water Division of its intent. If, in the opinion of the utility, more stringent water measures are required, the utility shall request Commission authorization to implement the mandatory conservation and rationing measures set forth in Section B.

The Commission shall authorize mandatory conservation and rationing by approving Schedule No. 14.1, Mandatory Water Conservation and Rationing. When Schedule No. 14.1 has expired, or is not in effect, mandatory conservation and rationing measures will not be in force. Schedule No. 14.1 will set forth water use violation fines, charges for removal of flow restrictors, and the period during which mandatory conservation and rationing measures will be in effect.

When Schedule No. 14.1 is in effect and the utility determines that water supplies are again sufficient to meet normal demands, and mandatory conservation and rationing measures are no longer necessary, the utility shall seek Commission approval to rescind Schedule No. 14.1 to discontinue rationing.

In the event of a water supply shortage requiring a voluntary or mandatory program, the utility shall make available to its customers water conservation kits as required by Rule 20. The utility shall notify all customers of the availability of conservation kits.

(continued)

PUBLIC NOTICE

NOTICE OF PUBLIC MEETING

Fruitridge Vista Water Company will be soliciting input to its Draft Urban Water Management Plan at a special public meeting scheduled for Monday, December 5, 2011 at 5:30 pm at the Jose P. Rizal Community Center at 7320 Florin Mall Dr, Sacramento, CA. The Urban Water Management Plan is a plan to assist the Company in managing its water supplies and water demands over a range of normal and emergency conditions.

A copy of this plan is available at the office of Fruitridge Vista Water Company at 1108 2nd Street, Sacramento, CA. The public is encouraged to attend this public meeting. Questions prior to the public meeting may be directed to Mark Chrisler by calling 916-443-2607 or in writing to the Company office address mentioned above.

SACRAMENTO BEE — OCT. 1 & 6 2011

Water System Evaluation

in Response to California Department of Health Services Compliance Order No. 04-01-05-CO-002

Fruitridge Vista Water Company

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Tables

1. Introduction

The State of California Department of Health Services (DHS) sent Fruitridge Vista Water Company (FVWC) a Compliance Order on August 29, 2005. The Compliance Order asks FVWC to solve its capacity and low pressure problems starting with an engineering analysis. The capacity and pressure problems started in 1998 when FVWC groundwater Well 11 was contaminated by the gasoline additive methyl tertiary butyl ether (MTBE). The Drinking Water Treatment and Research Fund (DWTRF), which is administered by DHS to water utilities impacted by MTBE, was made available for water replacement for that well. Two new wells (Wells 16 and 17) were constructed to replace the groundwater capacity and pressure formerly supplied by Well 11. Wells 1, 2, and 12, which are in the northeast section of the FVWC water service area, were also contaminated by MTBE shortly after the contamination of Well 11. FVWC took those wells offline due to contamination.

The DHS has informed FVWC that funds are available from the DWTRF to replace groundwater well capacity and to increase pressure caused by the contamination of MTBE at Wells 1 and 2. DHS has further advised that State Revolving Funds (SRF) are available for replacement of Well 12. Well 12 was initially taken offline due to PCE contamination but was also contaminated by MTBE in the same time period as Wells 1 and 2.

This Water System Evaluation by Boyle Engineering is submitted as an engineering study in response to the Compliance Order. The Compliance Order requests information on the remedies for the replacement of lost capacity and system pressures. This study is essentially a focused study of the effects of MTBE contamination at Wells 1, 2, and 12 on FVWC's water system. The engineering study reveals that the loss of water capacity and system pressure in the FVWC system, which is the concern of the Compliance Order, was largely caused by the loss of Wells 1, 2, and 12.

2. Background

FVWC operates an investor-owned water utility located in southern Sacramento County, California. The service area and pipeline distribution system is shown in Figure 1. The California Public Utilities Commission (PUC) regulates the water utility due to its investor-owned status. It is also regulated by the DHS under its current operating permit. FVWC is bisected by State Route 99, with the majority of the area to the east of SR 99 being residential homes, some light commercial and three schools. The areas to the west of SR 99 are primarily commercial, light industrial with some residential, and two schools. There are approximately 480 metered and 4,300 nonmetered services with some potential for growth in the south and southwest areas. FVWC's service area is surrounded by other water purveyors, the city of Sacramento on three sides and Citizens Utility Company of California (CUCC), another investor-owned utility, on the south side.

3. Groundwater Wells

FVWC is totally dependent upon local groundwater for supply and currently has 17 wells within their system. The locations of these wells are shown in Figure 1, and the current capacities and

status are shown in Table 1. Wells 1 and 2 have been impacted by the groundwater contaminant MTBE. Well 2 is disconnected from the system. Well 1, which is below the MCL for MTBE, is used only to meet peak demands. Well 12 has also been impacted by MTBE and tetrachloroethylene (PCE) and is offline. Wells 3, 5, 6, and 16 have shown detectable levels of MTBE. Well 11 is offline due to MTBE contamination. Well 15 is inactive due to levels of manganese above the maximum contaminant level (MCL) as established by DHS.

The existing wells have the following approximate capacity based on flow meter readings taken in November 2005:

- Active wells: 5,050 gpm
- Standby wells: 2,830 gpm
- Inactive wells: 2,850 gpm
- Total inactive and standby wells: 7,880 gpm

The California Regional Water Quality Control Board (RWQCB) and DHS have expressed concerns that, due to the proximity to the MTBE plumes and construction characteristics of Wells 1, 2, and 12, they are recommending that these wells be destroyed.

4. Interties to Adjacent Water Purveyors

FVWC can, in an immediate emergency situation, temporarily provide additional water supply through up to six interties that exist between the two other adjacent water purveyors—the City of Sacramento and CUCC. These interties are shown in Figure 1 and are named as follows:

Number	Name	Owner	General Location
1	Luther Drive	Sacramento	Southwest
2	26th Avenue and Ethel Way	Sacramento	North
3	Young Street and Nina Way	Sacramento	North
4	Stockton Boulevard and 48th	Sacramento	East
5	53rd and Burdett	Sacramento	Southeast
6	Bowling Drive	CUCC	South

During the summer of 2005, these interties were available but not utilized to supplement the water system due to the periodic loss of production from Wells 1, 2, and 12.

The City of Sacramento has provided a map (Figure 2) showing the location of these interties and other potential connection points with preliminary capacities and residual pressures should FVWC permanently connect to some of the locations to supplement their supply during peak demand periods. For example, as shown on Figure 2, location 9 near Fruitridge Road and Dewey Boulevard, a capacity of 7.1 mgd (4,930 gpm) is available at a residual pressure of 38 psi. These preliminary capacities and pressures are based on the City of Sacramento's hydraulic model during a maximum day demand condition. Peak hour demand conditions would be slightly improved according to Sacramento due to the addition of pumping equipment during that condition.

The City of Sacramento operates this system at pressures in the mid-40 psi range during average day demands and in the high 30 psi range during maximum day demands. In order for this source to provide supplemental capacity at pressures that FVWC historically provided before loss of the production of Wells 1, 2, 12, and others (40 psi or greater), the pressures would need to be increased by booster pumps at the connection points. The booster pumps would also compensate for the losses in pressure due to meters and backflow devices required by the City of Sacramento at a permanent connection.

5. Existing and Future Water Demands

Water demands, as obtained from FVWC records during 2001, 2002, and 2004, were utilized to estimate average day, maximum day, and peak hour demands for the water system. The existing 2005 demands were then estimated as presented in Tables 1, 2, and 3. Well capacities taken from flow meter readings in 2005 are also presented in Table 1. The estimated 2005 demands are shown below.

Condition 1 Estimated 2005 demands to satisfy existing customers

Average day:	2,987 gpm
Maximum day:	7,030 gpm
Peak hour:	8,900 gpm
Approximate yearly water usage:	1,570 MG

Water demands to satisfy recently proposed growth in the FVWC service area, consisting of commercial and residential developments, are shown in Table 4 and Figure 3. These areas are collectively referred to as the 550 units. These demands, combined with existing demands, are shown below.

Condition 2 Estimated 2005 demands including near-future proposed growth for 550 residential/commercial units

Average day:	3,473 gpm
Maximum day:	8,174 gpm
Peak hour:	10,348 gpm
Approximate yearly water usage:	1,825 MG

Water demands to satisfy the proposed 550-unit development plus an additional 500 residential units were also estimated and are shown below.

Condition 3 Estimated 2005 demands including near-future proposed growth for 550 residential/commercial units plus 500 future residential equivalent units

Average day:	3,725 gpm
Maximum day:	8,766 gpm
Peak hour:	11,098 gpm
Approximate yearly water usage:	1,958 MG

6. DHS Compliance Order 01-09-05-C0-002

On August 29, 2005 DHS issued Compliance Order 01-09-05-C0-002 to FVWC for violation of the minimum system pressure requirements and insufficient capacity. A copy of the Order is included in the Appendix. Following are excerpts of the findings of fact and requirements of the Order.

Findings of Fact

Fruitridge Vista Water Company's (hereinafter, FVWC) domestic water system is supplied by fourteen active wells. FVWC has no water storage facilities within the distribution system. Therefore, the only means of maintaining proper water distribution system pressure is to operate additional wells as demand increases. On numerous occasions, FVWC has failed to maintain adequate and safe pressure(s) in the distribution system. The pressure losses were apparently caused, in part, by pumping equipment failures at the wells. It is unclear whether the pump failures were due to poor system maintenance, an insufficient number of standby generators, and/or inadequate, or absent system controllers. A list of the individual low pressure events are listed in the following Table A:

It should be noted that the events shown in Table A reflect periods of time when Wells 1 and 2 were off due to MTBE contamination.

Low pressure in the distribution system may allow pathogens to enter the distribution system. If such a scenario were to occur, there may be insufficient disinfectant residual to inactivate pathogens entering the distribution system creating a health risk to consumers.

Requirements of Law

According to Section 64562(a), California Waterworks Standards, Chapter 16, Title 22, California Code of Regulations (CCR), "Sufficient water shall be available from the water sources and distribution reservoirs to supply adequately, dependably and safely the total requirements of all users under maximum demand conditions before agreement is made to permit additional service connections to a system."

According to Section 64562(c)(1), California Waterworks Standards, Chapter 16, Title 22, California Code of Regulations (CCR), "Requirements for an entire public water system shall be determined from the total source capacity, total storage volume and the total number of service connections."

According to Section 64566(a), California Waterworks Standards, Chapter 16, Title 22, California Code of Regulations (CCR), "...distribution systems shall be designed to maintain an operating pressure at all service connections of not less than 20 pounds per square inch gauge (psig) (140 kiloPascals gauge (kPag) under the following demand conditions:

(1) User maximum hour demand....

Table A

Event	*Date*	*Well No.*	*Pressure*	*Duration*
1	*May 22, 2003*	*Well No. 3*	*3 psi*	*0.5 hours*
2	*May 27, 2003*	*Well No. 3*	*14-20 psi*	*3 hours*
3	*May 27, 2003*	*Well No. 5*	*17-20 psi*	*1 hour*
4	*May 27, 2003*	*Well No. 16*	*19 psi*	*1 hour*
5	*May 27, 2003*	*Well No. 17*	*17 psi*	*Briefly*
6	*May 28, 2003*	*Well No. 3*	*14-20 psi*	*3.5 hours*
7	*May 28, 2003*	*Well No. 5*	*18-20 psi*	*1.5 hours*
8	*May 28, 2003*	*Well No. 16*	*19 psi*	*2 hours*
9	*May 29, 2003*	*Well No. 17*	*16-20 psi*	*17 times in three days*
10	*June 1, 2003*	*Well No. 3*	*14-20 psi*	*3.5 hours*
11	*June 1, 2003*	*Well No. 5*	*18-20 psi*	*2 hours*
12	*June 1, 2003*	*Well No. 10*	*19-20 psi*	*2 hours*
13	*June 1, 2003*	*Well No. 16*	*15-20 psi*	*3 hours*
14	*June 2, 2003*	*Well No. 3*	*15-20 psi*	*4.5 hours*
15	*June 2, 2003*	*Well No. 10*	*18-20 psi*	*2 hours*
16	*June 2, 2003*	*Well No. 16*	*15-20 psi*	*3 hours*
17	*June 2, 2003*	*Well No. 17*	*17-20 psi*	*3 hours*
18	*June 2, 2003*	*Well No. 17*	*17-20 psi*	*2 hours*
19	*July 4, 2003*	*Well No. 3*	*11 psi*	*2 hours*
20	*July 10, 2003*	*Well No. 3*	*18 psi*	*Briefly*
21	*July 12, 2003*	*Well No. 3*	*10-11 psi*	*9 hours*
22	*August 13, 2003*	*Well No. 10*	*18-20 psi*	*1 hour*
23	*May 3, 2004*	*Well No. 13*	*12-19 psi*	*57 hours*
24	*May 26, 2004*	*Well No. 3*	*10-20 psi*	*35 hours*
25	*June 2, 2004*	*Well No. 17*	*18 psi*	*Briefly*

Section 116555 of the Health and Safety Code states the following:

> *(a) Any person who owns a public water system shall ensure that the system does all of the following:*
>
> > *(3) ... provides a reliable and adequate supply of pure, wholesome, healthful, and potable water...*

Section 116655 of the Health and Safety Code state the following:

> *An order issued pursuant to this section may include, but shall not be limited to, any or all of the following requirements:*
>
> > *(1) That the existing plant, works, or system be repaired, altered, or added to.*
> >
> > *(2) That purification of treatment works be installed.*
> >
> > *(3) That the source of the water supply be changed.*
> >
> > *(4) That no additional service connection be made to the system.*
> >
> > *(5) That the water supply, the plant, or the system be monitored.*
> >
> > *(6) That a report on the condition and operation of the plant, works, system, or water supply be submitted to the Department.*

Conclusions of Law

Based on the above Findings of Fact and Requirements of Law, the Department finds that FVWC has violated Sections 64562(a) and 64566(a), Chapter 16, Title 22, of the CCR. In addition, the Department finds that FVWC has violated Section 116555(a)(3) of the CHSC. Specifically, FVWC had not demonstrated the ability to consistently and safely maintain a minimum operating pressure of 20 psi in the distribution system.

Order

Pursuant to Section 11655 of the Health and Safety Code, the Department hereby orders FVWC, to do the following:

FVWC shall modify, repair, and/or replace as necessary FVWC's standby power supply, control systems, and pumping equipment in order to render the distribution system capable of providing sufficient pressure and supply as stated in the requirements set forth in Section 64562 and 64566 of the CCR. FVWC shall submit a letter describing the upgrades and/or replacement(s), including a schedule for completing them, no later than October 31, 2005.

1. *FVWC shall maintain a disinfectant residual in the distribution system until the Department directs FVWC otherwise. The minimum disinfectant residual shall be no less than 0.5 milligrams per liter of free chlorine entering the distribution system.*

2. *FVWC shall identify and provide additional source(s) of supply (i.e. groundwater or purchased water) in order to provide adequate supply and pressure in the distribution system.*

3. *FVWC shall perform a study evaluating the options for providing additional source(s) of supply to remedy the supply and distribution system pressure problems. The options studied shall include, at a minimum:*

    a. *Long-term purchase of surface water from the City of Sacramento*

    b. *Construction of new well source(s) and associated treatment facilities. The study shall also include a cost comparison of all options evaluated. The study shall be submitted to the Department by November 30, 2005.*

4. *Based on results of the study, FVWC shall submit a letter describing the proposed system changes, upgrades, and/or additional sources including a schedule for completion, no later than January 31, 2006.*

As a result of the Compliance Order and the FVWC's own concerns for providing a safe and an adequate water supply to its customers, an analysis was prepared to determine viable alternatives to restoring capacity. It should be noted that during the periods of low pressure identified in Table A, FVWC was in compliance with their bacteriological sampling program as reported to DHS. The following section discusses the water system analysis prepared for this purpose.

7. Water System Analysis

A hydraulic model was prepared for the FVWC supply and distribution system to simulate pressure and flow throughout the system under varying conditions. Model runs were made using the existing 2005 conditions under average day, maximum day, and peak hour demand scenarios. Various well combinations were modeled to check resulting pressures and expected flows from wells, both standby and active. A summary of these model runs is shown in Table 5. The purpose of simulating these combinations was to evaluate the systems ability to provide the minimum pressures required by DHS and the pressures historically provided by FVWC and as required by the PUC.

In all of the runs, Wells 11 and 15 were off due to their current inactive status.

- In Run 1, Well 12 was also off. This resulted in pressures in some areas dropping below 30 psi, but remained above the DHS minimum of 20 psi. Pressures were, however, below the PUC requirement of 40 psi.

- In Run 2, Well 12 was on and the resulting pressures simulated were greater than 40 psi.

- In Run 3, the same condition as Run 1 was simulated except with the largest well (No. 13) also off. The resulting pressures dropped below 10 psi.

- In Run 4, Well 12 was left on and Well 13 (the largest well) was off. The resulting pressure dropped below 20 psi.

- In Run 5, Well 12 was off in addition to Well 2, which is impacted by MTBE. Pressures dropped below the minimum 20 psi requirement of DHS and below the PUC requirement of 40 psi as well. This demonstrates that the system was able to meet the minimum DHS requirements without Well 12 but not with both 12 and 2 off.

- In Run 6, Well 2 was off and Well 12 was on with the resulting pressures being above 35 psi.

- In Run 7, Wells 1 and 2 were both off and Well 12 was off with the resulting pressures being below 10 psi.

- In Run 8, Wells 1 and 2 were both off and Well 12 was on with the resulting pressures being just above 20 psi.

The conclusions of these simulations would be that when Well 12 is off due to groundwater contaminants, the system was able to meet minimum DHS requirements of 20 psi with Well 1 and Well 2 being operated. Also, in order to restore pressures to above 40 psi under these simulated conditions, Wells 1, 2, and 12 would all need to be operated. However, should Well 13 (the largest well in the system) be off for service, an additional emergency supply (such as Well 15) would be required temporarily.

8. Modeling for Proposed and Future Demand Conditions

Additional water system modeling was done to simulate demand conditions to satisfy the proposed 550 units discussed previously as well as a future 500 residential units. Due to the lack of well capacity, it was necessary to add supply from a combination of intertie connections to the Sacramento system as well as additional wells within FVWC's service area. Initial placement of these wells was provided by the FVWC staff. These locations will need to be further verified by DHS and the RWQCB prior to purchase of the property. It is recommended that a test well be constructed at each site to confirm the water quality prior to constructing the production well. A value of 650 gpm was chosen for the new wells as this capacity is typical of most of the other FVWC wells and because new wells may need to be moderately sized and strategically located to avoid MTBE contamination now and in the future.

The results of the modeling are shown in Table 6 with combinations of two interties to the Sacramento system and three new 650-gpm wells. Results are shown for the existing conditions, existing plus the proposed 550 units, and existing plus 550 units plus 500 future units. Due to the absence of well supply in the northeast area because of the loss of Wells 1, 2, and 12, it was necessary to also add transmission mains within the distribution system to reduce headlosses across the system and from the new individual new wells where they connect to the system. This is also

advisable to improve fire flow capacities throughout the system. Figure 4 illustrates the proposed system to accommodate the proposed interties and the three new wells to satisfy the future demands. The modeling scenarios also took into consideration the largest well in the system (Well 13) being off for service during the peak hour demand periods. Pressures were simulated to be greater than 40 psi under all conditions with these proposed improvements.

The proposed improvements as discussed above and shown in Figure 4 can be summarized as follows:

- Connections to the City of Sacramento (2,911 gpm)
  - Fruitridge and Ethel Avenue with booster pumps
  - Luther Avenue with booster pumps
- Transmission mains
  - 14,000 feet of 8-inch mains including connections and appurtenances
  - 2,240 feet of 10-inch mains including connections and appurtenances
  - 12,700 feet of 12-inch mains including connections and appurtenances
- Municipal wells
  - Three new 650-gpm municipal wells

This alternative (Alternative A) was selected because of cost, flexibility, speed to implement, and variability due to nondependence only one source should there be failure in a source. A description of the other alternatives studied is presented in the following section.

9. Additional Alternatives for Restoring Capacity

9.1 Alternative B

An Alternative B was studied, which consisted of only connecting to the City of Sacramento water system to satisfy the supply deficiencies. The following connection points would be required, together with additional transmission mains, to reduce headloss across the system.

- Connections to City of Sacramento (4,861 gpm)
  - Fruitridge and Ethel Avenue with booster pumps
  - Luther Avenue with booster pumps
  - Stockton Boulevard at 48th with booster pumps
- Transmission mains
  - 14,000 feet of 8-inch mains including connections and appurtenances
  - 2,240 feet of 10-inch mains including connections and appurtenances
  - 12,700 feet of 12-inch mains including connections and appurtenances

Alternative B would require a third connection point to the Sacramento system due to the large quantity of water required (4,861 gpm) in order to satisfy peak hour demands with the additional proposed 550 units plus the future 500 units.

9.2 Alternative C

An Alternative C was also studied, which consisted of constructing relatively shallow wells in the areas near Wells 1, 2, 11, and 12 and equipping them with wellhead treatment using granular activated carbon (GAC) for removal of MTBE. The four wells would have a capacity of approximately 650 gpm each. Existing Wells 1, 2, 11, and 12 would be destroyed due to the RWQCB's concerns with cross contamination of the upper and lower aquifers via these wells. These four wells would provide a capacity of 2,600 gpm. Considering a total of 4,861 gpm is required to satisfy future demands with the largest well out of service, an additional three approximately 750-gpm wells are required to meet peak hour demands. It was assumed that these wells would not require treatment if located in areas not impacted by MTBE plumes. The GAC treatment equipment would consist of four 12-foot-diameter pressure vessels containing 20,000 pounds of GAC per vessel operated with two vessel pairs in series. The treatment units are assumed to run approximately 80 percent of the time (duty factor) with a carbon utilization of approximately 0.5 lb/1,000 gal with an empty bed contact time of 30 minutes. Carbon costs were estimated at approximately $1.20/lb.

Due to the number of proposed new wells in Alternative C, no new transmission mains were assumed to be required to distribute the well water into the system. This alternative is summarized as follows:

- Municipal wells
  - Four new 650-gpm municipal wells with GAC wellhead treatment
  - Three new 750-gpm municipal wells
  - GAC replacement for 30 years

9.3 Alternative D

Alternative D (no-project alternative) was reviewed as is typically done in accordance with the California Environmental Quality Act (CEQA). This alternative was not considered feasible due to the health and safety concerns that could be caused by not providing adequate potable water to customers and for fire fighting. The issues of concern are detailed further by DHS in the Compliance Order in the Appendix.

10. Opinions of Probable Cost for Alternatives

Opinions of probable construction cost and operation and maintenance costs associated with GAC wellhead treatment, where applicable, were prepared for Alternatives A, B, and C. These estimates are shown below.

10.1 Alternative A

An itemized estimate of probable construction cost for the proposed infrastructure improvements shown in Figure 1 is given below and is detailed in Tables 7, 8, 9, and 10.

- Connection to City of Sacramento water system per Tables 7 and 8

- Fruitridge and Ethel Avenue with booster pumps:		$222,040
- Luther Avenue with booster pumps:		192,153
	Subtotal	$414,193

- Transmissions mains as estimated in Table 9 and shown in Figure 1

- 8-inch mains including connections:	14,000' @ $84/ft		$1,176,000
- 10-inch mains including connections:	2,240' @ $101/ft		226,240
- 12-inch mains including connections:	12,700 @ $117/ft		1,485,900
		Subtotal	$2,888,140

- Municipal wells as estimated in Table 10

- Three new 650-gpm municipal wells	$3,000,000

In addition to these estimated costs, the City of Sacramento will require FVWC to pay a connection charge based on the requested capacity from their system to make up the difference in water supply to satisfy peak hour demand with the largest well (1,275 gpm) off for service. Based on the modeling done under these conditions, as shown in Table 6, a capacity of approximately 2,911 gpm (4.192 MG) will be required from the City of Sacramento system. This flow rate will be intermittent and will only be used under these conditions. The cost for this capacity charge at a rate provided by the City of Sacramento is as follows:

- Capacity charge for 4.192 mgd at $1,751,958/mgd: $7,343,928

Water purchased from Sacramento will cost the water company $187/AF, or $574/MG used. This cost could range between approximately $13,000 and $32,000 per year, depending on the water demands each year that exceed the available well capacity. These values are estimated as follows and consider the current proposed growth plus the future 500 units.

- Minimum Usage

Assumptions: All wells are operational (9,380 gpm), including Well 13, and can satisfy maximum day demand of 8,766 gpm but not the peak hour demand of 11,098 gpm.

Peak hour demand occurs approximately 3 hours/day for 75 days/year.

The Sacramento water used would be:

(11,098 gpm – 9,380 gpm) x 3 hr x 60 x 75 days = 23.2 MG

The water cost would then be approximately $13,000/year.

- Maximum Usage

  Assumptions: The largest well is off all summer, leaving 8,105 gpm well capacity, which cannot meet peak hour or maximum day demand.

  The connection would be supplying the excess over maximum day demand for approximately 5 hours/day and the difference between peak hour for 3 hours/day for 75 days/year.

  The Sacramento water used would be:

  [(11,098 gpm – 8,105 gpm) x 3 hr x 60 x 75 days] +
  [(8,766 gpm – 8,105 gpm) x 5 hr x 60 x 75 days] = 55.3 MG

  The water cost would then be approximately $32,000/year.

The total estimated cost for the infrastructure costs and capacity charges for Alternative A, assuming three new wells can be constructed with good quality water, without consideration of the yearly water costs, would therefore be:

• Connection to City of Sacramento:		$ 414,193
• Transmission mains:		2,888,140
• Wells:		3,000,000
• Capacity charge:		7,343,928
	Total	$13,646,261

10.2 Alternative B

An itemized estimate of probable construction cost for the proposed infrastructure improvements required for Alternative B are given below.

- Connection to City of Sacramento water system per Tables 7 and 8

- Fruitridge and Ethel Avenue with booster pumps:		$222,040
- Luther Avenue with booster pumps:		192,153
- Stockton Boulevard at 48th with booster pumps:		192,153
	Subtotal	$606,346

- Transmissions mains as estimated in Table 9 and shown in Figure 1

- 8-inch mains including connections:	14,000' @ $84/ft		$1,176,000
- 10-inch mains including connections:	2,240' @ $101/ft		226,240
- 12-inch mains including connections:	12,700 @ $117/ft		1,485,900
		Subtotal	$2,888,140

- Capacity charge for 4,861 gpm (7.00 mgd) at $1,751,958/MGD: 12,263,426

The total estimated cost for the infrastructure cost and capacity charges for Alternative B without consideration of the yearly water costs, would therefore be:

• Connection to City of Sacramento:		$ 606,346
• Transmission mains:		2,888,140
• Capacity charge:		12,263,426
	Total	$15,757,912

10.3 Alternative C

An itemized estimate of probable construction cost for the proposed infrastructure improvements required for Alternative C are given below:

- Municipal wells as estimated in Table 9
  - Seven new 650- and 750-gpm municipal wells: $7,000,000
- Wellhead treatment for MTBE per Table 10
  - Four 650-gpm wellhead treatment facilities (@ 1,088,600 ea) $4,354,400
- GAC maintenance costs
  - Four facilities @ $163,987/year $ 655,949 / yr
  - Present worth @ 3% over 30 years: $12,850,000

The total estimated cost for the infrastructure cost and GAC maintenance costs for Alternative C would therefore be:

• Municipal wells:		$ 7,000,000
• Wellhead treatment facilities:		4,354,400
• GAC maintenance costs (30 years)		12,850,000
	Total	$24,204,400

11. Allocation of Estimated Costs to Satisfy Existing Demands

An allocation of the costs to restore the lost capacity of the FVWC system to historic levels and to comply with PUC requirements was prepared as follows. Separate cost estimates were prepared to restore capacity to meet existing demands using an approach similar to the selected Alternative A. This approach consists of connections to the City of Sacramento, the addition of transmission mains needed to convey water to satisfy existing peak hour demands according to model results, and the construction of two new 650-gpm wells. These improvements are shown in Figure 5. This approach provides approximately 1,465 gpm from Sacramento and 1,300 gpm from two new wells. This additional capacity of 2,730 gpm plus the existing capacity of Wells 3, 4, 5, 6, 7, 8, 9, 10, 14, 16, and 17 (Well 13 off as largest well), which is 6,135 gpm, equals 8,900 gpm (existing peak hour demand). The costs estimated for this approach to increasing capacity are as follows:

- Connection to City of Sacramento water system per Tables 7 and 8

- Fruitridge and Ethel Avenue with booster pumps:		$222,040
- Luther Avenue with booster pumps:		192,152
	Subtotal	$414,192

- Distribution mains per Figure 5

- 8-inch mains:	5,029' @ $84/ft	$422,400
- 10-inch mains:	14,000' @ $101/ft	1,032,200
	Subtotal	$1,454,600

- Wells

- Two new 650-gpm wells @ $1,000,000 each	$2,000,000

- Sacramento water purchase (1,465 gpm)

- 2.11 mgd x $1,751,958/mgd	$3,695,931
Annual water cost for 167 AF of Sacramento water @ $187/AF is $31,229/year (water use is reduced by 40% with this option due to the addition of two new wells)	
Present worth of annual water cost over 30 years @ 3% rate of return:	$612,008
Total	$8,176,811

The funding sources for the proposed projects consist of funds from the State Drinking Water Treatment and Research Fund (DWTRF), which funds MTBE impacted water systems and from other State loan/grant programs (such as SRF) available to FVWC. The DWTRF funds are available to FVWC to restore the system as a result of MTBE impacts. Wells 1 and 2 have been designated by the State as impacted by MTBE. However, Well 12 has not been designated as such because it was previously impacted by PCE; therefore, it is not eligible for DWTRF funding now. There is, however, funding available for Well 12 through the SRF funding program. The following rationales for allocation of a portion of the $8.18M estimated cost to be funded under the DWTRF programs is presented.

If the capacities of Wells 1, 2, and 12 (1,580 gpm) are included with the other FVWC active and standby wells (6,135 gpm), which includes Wells 3, 4, 5, 6, 7, 8, 9, 10, 14, 16, and 17 (Well 13 is not included as it is the largest well), the total capacity of 7,715 gpm is still approximately 1,185 gpm short of the estimated existing peak hour demand of 8,900 gpm. Therefore, the cost for one new, larger, pre-MTBE-impacted well approximately the size of Well 13 would be necessary to comply with DHS and PUC criteria regardless of the loss of Wells 1, 2, and 12. Prior to the MTBE contamination, larger wells were a viable solution to providing additional capacity. The cost for this additional well would be approximately $1M and would be subtracted from the estimated cost

of $8.18M, for a remainder of $7.18M. If this cost is divided equally between Wells 1, 2, and 12, approximately $2.39M would be allocated to Well 12 and $4.79M to Wells 1 and 2.

Another rationale to dividing the cost between Wells 1, 2, and 12 would be to observe the impacts to the system pressures due to the loss of each of these wells. As shown in the modeling runs in Table 5, system pressures were above 40 psi with all wells on except 11 and 15. When Well 12 is off under the same condition, average pressures drop to approximately 32 psi. When Well 2 is off in addition to Well 12 under the same condition, average pressures drop to approximately 19 psi. When Well 1 is also off in addition to Wells 12 and 1, minimum pressures drop to 3 psi. This demonstrates that each of these wells have approximately equal cumulative effects on the system and, therefore, should have an equal share of the costs to bring the system back to its original condition.

12. Allocation of Cost to Proposed and Future Growth

The proposed addition of 550 units of commercial and residential developments, as shown in Table 4, and the addition of 500 residential units in the future will need to share in the cost of the proposed improvements described in Alternative A and shown in Figure 4. The allocation of these costs may be proportioned as follows or in a similar manner to be determined by FVWC and the PUC.

• Alternative A estimated cost		$13,646,261
• Less cost to restore system to existing		8,176,811
	Total	$ 5,469,450

It is estimated that of the $5.47M cost estimated for the proposed and future developments, approximately $1.6M should be allocated to the future 500 units, leaving approximately $3.87M to be shared by the 550 units. The total equivalent dwelling units (EDUs), as shown in Table 4, for the 550 units is 796. If this cost is allocated to the proposed 550 units as a connection charge, approximately $4,861 per EDU would result. However, not all of the 550 units may connect in the future, so if an assumption of 70% connections is made, a connection charge of approximately $7,000 per EDU is calculated. This should provide a conservative estimate should some of the 550 units delay or not connect in the future. This connection charge may need to be escalated somewhat due to inflation. The majority of the proposed improvements are needed very soon to restore the system and to prepare for the change in operation of the system using the Sacramento water.

13. Standby Generator and Short-Term Improvements

FVWC is anticipating relocating the existing standby generator at Well 11 to another well during 2006. With only three wells equipped with generators (Wells 14, 16, and 17) during the average day demand, system pressures would drop below 40 psi during an power outage. If the generator were relocated to Well 13, modeled pressures would be approximately 55 psi minimum throughout the system during average day demand during a power outage. During a maximum day demand with these four wells (Wells 13, 14, 16, and 17) equipped with generators, modeled pressures would be less than 15 psi in the northern areas with no other improvements. By adding a new generator to

the system at Well 7 or one of the new wells (if drilled), modeled pressures would increase to above 30 psi during a power outage at maximum day demand.

Based on these analyses, it appears that the following short-term improvements should be implemented to strengthen the system and further engineering study and design be conducted of the long-term solutions discussed in this report.

- FVWC should confirm that all active and standby wells and the pumping equipment are in good working order prior to the peak demand periods of the summer of 2006. This includes all pressure switches, electrical services, valves, and hydropneumatic tank equipment. Test all standby wells regularly to confirm reliability.

- Relocate the generator at Well 11 to Well 13 and install an automatic transfer switch. Confirm that automatic transfer switches are present and working at Wells 14, 16, 17 to allow automatic starting with a power outage. This should be done prior to the summer of 2006. Consider installing a generator with automatic transfer switch to Well 7 by 2006.

14. Project Scheduling

A preliminary project schedule for implementing the improvements described in Alternative A is shown in Figure 6. Some of the elements may be dependent on the funding sources and further investigations of well locations and groundwater quality/quantity.

APPENDIX D

Department of Health Services Engineering Report for Public Water System 3410023

State Department of Health Services

Drinking Water Field Operations Branch

Engineering Report

For the Consideration of a Permit to the

Fruitridge Vista Water Company

Serving the Residents of the Fruitridge Vista Area in Sacramento County

Public Water System No. 3410023

Sacramento County

October 2004

DOMESTIC WATER SUPPLY PERMIT NO. 01-09-04-PER-007

Carl Lischeske, P.E., Chief
Northern California Region
Division of Drinking Water and
Environmental Management

Engineering Report Prepared By
Dave Remick, Sanitary Engineer
Drinking Water Field Operations Branch

ENGINEERING REPORT
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